BUSINESS HORIZONS

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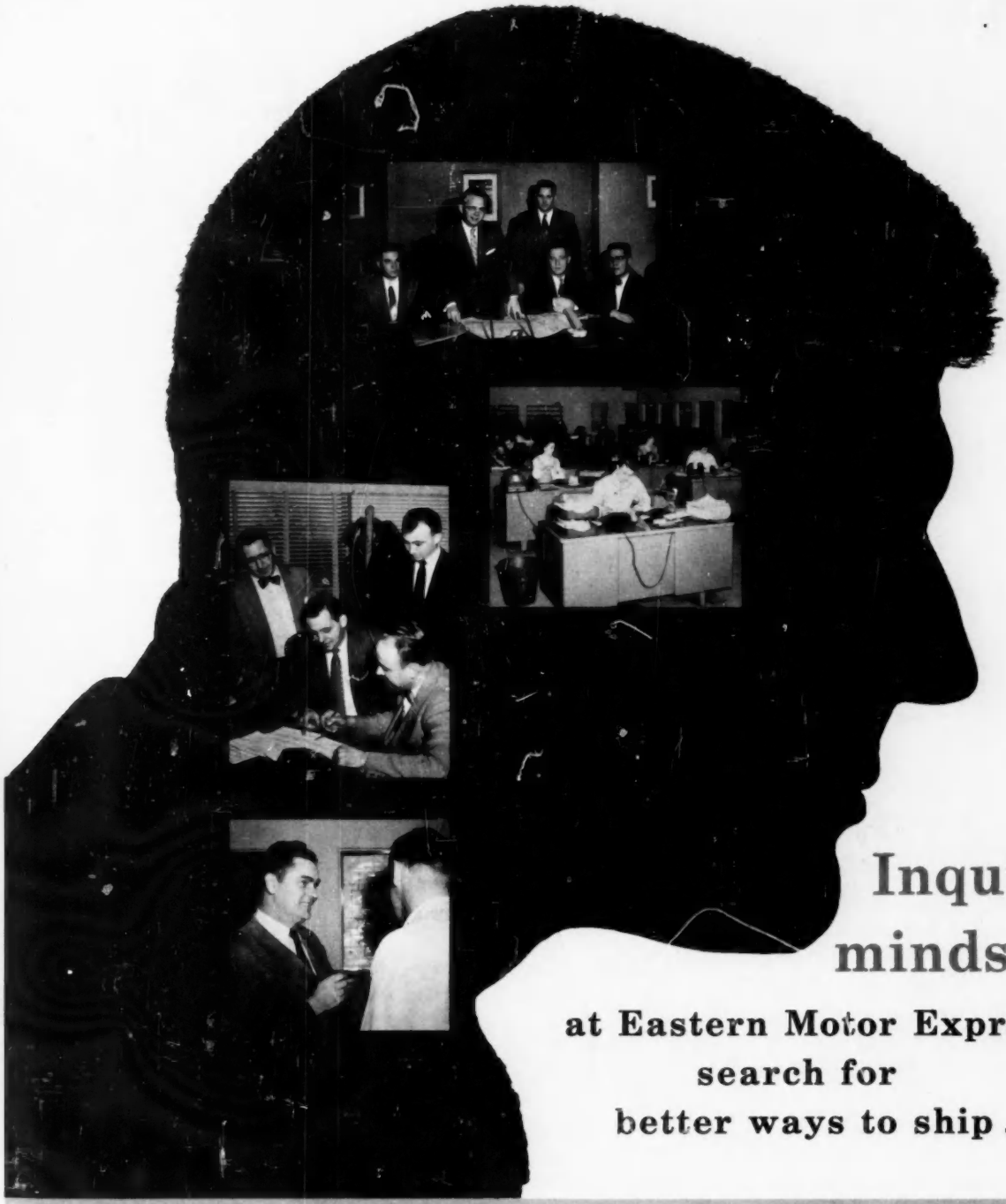

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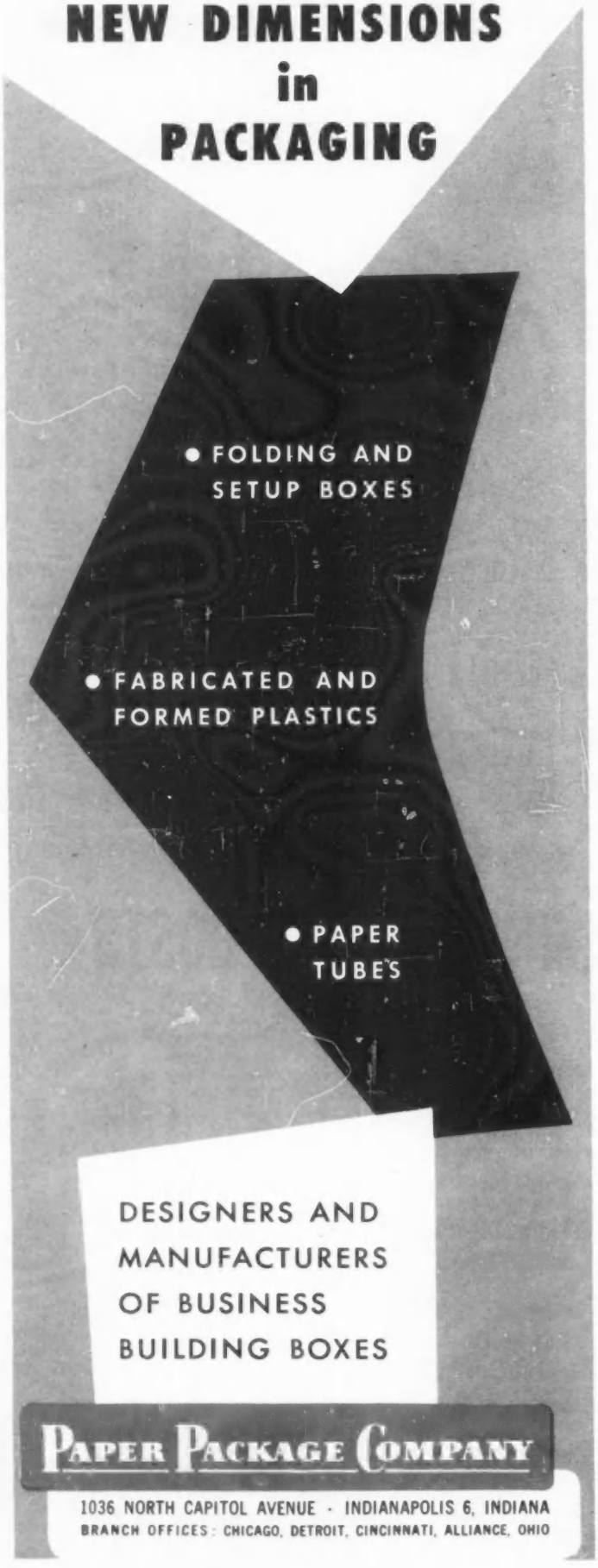
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Articles in Brief

THE NEW EUROPEAN MARKET

PAUL G. HOFFMAN

THE approval of Euratom and, more important, the Common Market (ECM) by the six Schuman Plan nations is a profoundly significant step toward Western European unity and prosperity. Hoffman outlines the measures that preceded Euratom and ECM, and discusses their future and import for the free world.

The first material effort in the direction of European economic cooperation was the Marshall Plan, which gave momentum for such measures as the highly successful Schuman Plan and the rejected European Defense Community. The latter failure endangered NATO, but its effect was mitigated by the three-pronged effort of the "new drive for European Union." This drive resulted in Euratom and the Common Market.

Hoffman discusses the provisions of the Common Market, among them the formation of a single competitive mass market and the curbing of restrictions on the free movement of labor and capital, and explains the proposed expansion of ECM into the Free Trade Area. Great Britain and other OEEC countries are negotiating for this looser arrangement (FTA) with the Schuman Plan nations. Progress has been slow because of agricultural exemptions and other provisions that would weaken some of the Common Market provisions. The desire of all nations concerned to effect this community, however, almost assures success.

The economic advantages of the Common Market will be great, not only for the participating members but for the United States as well, especially in increased demand for our raw materials and foodstuffs. U.S. trade policies will have to be liberalized if we are to take advantage of export opportunities.

Even more important, the ECM is the most effective possible deterrent to the satellite countries' acceptance of Communist rule.

PRODUCTIVITY: FACTS AND FICTION

THEODORE N. BECKMAN AND ROBERT D. BUZZELL

BECAUSE productivity is a "hot new issue," more heat than light is being generated. Leaders of business and organized labor, aware of the public and governmental interest surrounding wage negotiations or announcements of price increases, have sought to utilize the same productivity statistics to justify opposite positions. In this general atmosphere of confusion and conflict, the basically objective character of productivity and its measures and usefulness in public and private policy formulation have tended to become obscured.

Beckman and Buzzell stress that productivity should not be misunderstood as production (productivity is the ratio of total output to total input) and that productivity is most often discussed in relation to wages because of the effects of this relationship on the price level. They give evidence that real wages have kept pace with productivity trends.

Among the common fallacies examined, together with the authors' conclusions, are:

- automation is responsible for substantial gains in productivity
  conclusion: the small increase in productivity within the auto industry indicates that automation is not as successful as has been generally assumed
- on the basis of productivity gains, workers can now (or soon will) produce as much in 30 hours as they have been producing in 40
  conclusion: on this basis, the 30-hour workweek is receding further into the future for the decline in worker input will not be balanced by productivity gains for 11 to 12 years in industry—even if (which is unlikely) productivity increased at a constant rate and the same percentage of the population were employed
- productivity gains occur consistently and automatically
  conclusion: productivity is not automatic; seeming gains in over-all productivity are sometimes due to shifts within industry

THE WIDENING POTENTIAL OF THE COMPUTER

E. W. MARTIN, JR.

THE electronic computer is often thought of solely in relation to office automation, but Martin points out that this giant new tool has many other overlooked applications. Even in the reduction of clerical work, we have much to learn about data-processing before the full potential of the computer can be realized.

Aside from data-processing, computers have been used with great success for scientific computations and for engineering problems. Their successful application to automatic control and defense purposes is best illustrated by the incredible SAGE air defense system. Within recent years, electronic computers have been used in operations research programs. The technique of linear programming is one of several techniques that have facilitated decision-making in situations involving many variables.

Martin states that future applications of these electronic computers will include language translation and retrieval of information from libraries. As theories of learning are developed, we may actually be able to program a computer to learn, and thereby obtain an important source of information about the operation of the human brain.

However, we must remember that although computers are powerful tools, they are only tools; their application and usefulness is limited by the limitations of our own knowledge.

HAS BUSINESS BORROWED TOO MUCH?

HARRY C. SAUVAIN

BORROWING by business has increased steadily in the past decade of economic growth. The total liabilities of business corporations have

continued to expand in spite of rising interest rates and tight money and are at a new all-time high level. The increase has been particularly marked in the period of cyclical upswing in business activity that began in 1954.

Now, with the business outlook clouded by uncertainty and the fear of recession being felt in some industries, the question arises whether business has borrowed too much.

Sauvain uses quarterly data on the financial condition of all manufacturing corporations to trace the development of corporate debt in relation to assets and equity capital during the three years from June 30, 1954, to the same date in 1957. He shows that business has indeed required substantial additional funds to carry on a larger volume of business, but that a large part of these funds has been provided in the form of equity capital. After three years of business expansion current liabilities were in a normal relationship to current assets and long-term debt is well supported both by earnings and assets.

Perhaps, suggests Sauvain, the question should be, "Has business borrowed enough?"

FITTING THE SALES FORECAST TO YOUR FIRM

JAMES B. BOULDEN

SALES forecasting is the firm's basic tool for anticipating the nature of future operations; it provides a basis for the profit forecast and all other planning activities of the firm. Boulden classifies the elements of sales forecasting and briefly explains them, in order to assist businessmen in making an informed choice among the alternatives in the preparation of an effective forecast. Businessmen must analyze their own products and markets to determine which forecasting procedure is most applicable to them.

The process of forecasting begins with a choice of sources of information—national sources, information from the market channel, and the internal records of the firm. An example of this type of forecasting is that done by the New Departure Division of General Motors, which prepares two separate forecasts, one from the contact of sales engineers with their customers, and another from an economic forecast using a national index.

This information may be assembled and processed by one or more of several basic techniques or methods of handling the forecasting information. Each of the general techniques—time-series analysis, correlation analysis, judgment, and sampling—may be used in several different types of forecasts. The basic forecasting types are discretionary and mechanical. Mechanical forecasts assume that past relationships will continue in the future, while discretionary forecasts assume that this is not necessarily true. Boulden presents the specific types of forecasts and the assumptions basic to each.

The success or failure of the firm depends greatly upon the proper selection and application of forecasting elements. The firm that makes no forecast is saying essentially that sales will not change, which is the conclusion most likely to be in error.

HOW TO QUANTIFY DECISION-MAKING

ROGER E. BALL AND ALLAN A. GILBERT

CONSTRUCTION of a decision matrix is fundamental to all types of major business decisions involving numerical data. Ball and Gilbert illustrate the procedure with a case study involving a question of equipment replacement. With some modification the approach can be applied to a great variety of such decisions.

At the start of the process, Ball and Gilbert stress the importance of the logical approach to business problems, and they give the four basic steps of logical analysis:

- listing each alternative
- measuring each alternative
- forecasting the results of each alternative
- constructing a "decision rule" to identify the most desirable alternative

There are many pitfalls in this decision process, such as failing to recognize all of the alternatives, disregarding the possibility of a combination of alternatives, and becoming so attracted by one alternative that other possibilities are ignored.

After the alternatives have been defined, a decision criterion must be selected, and the

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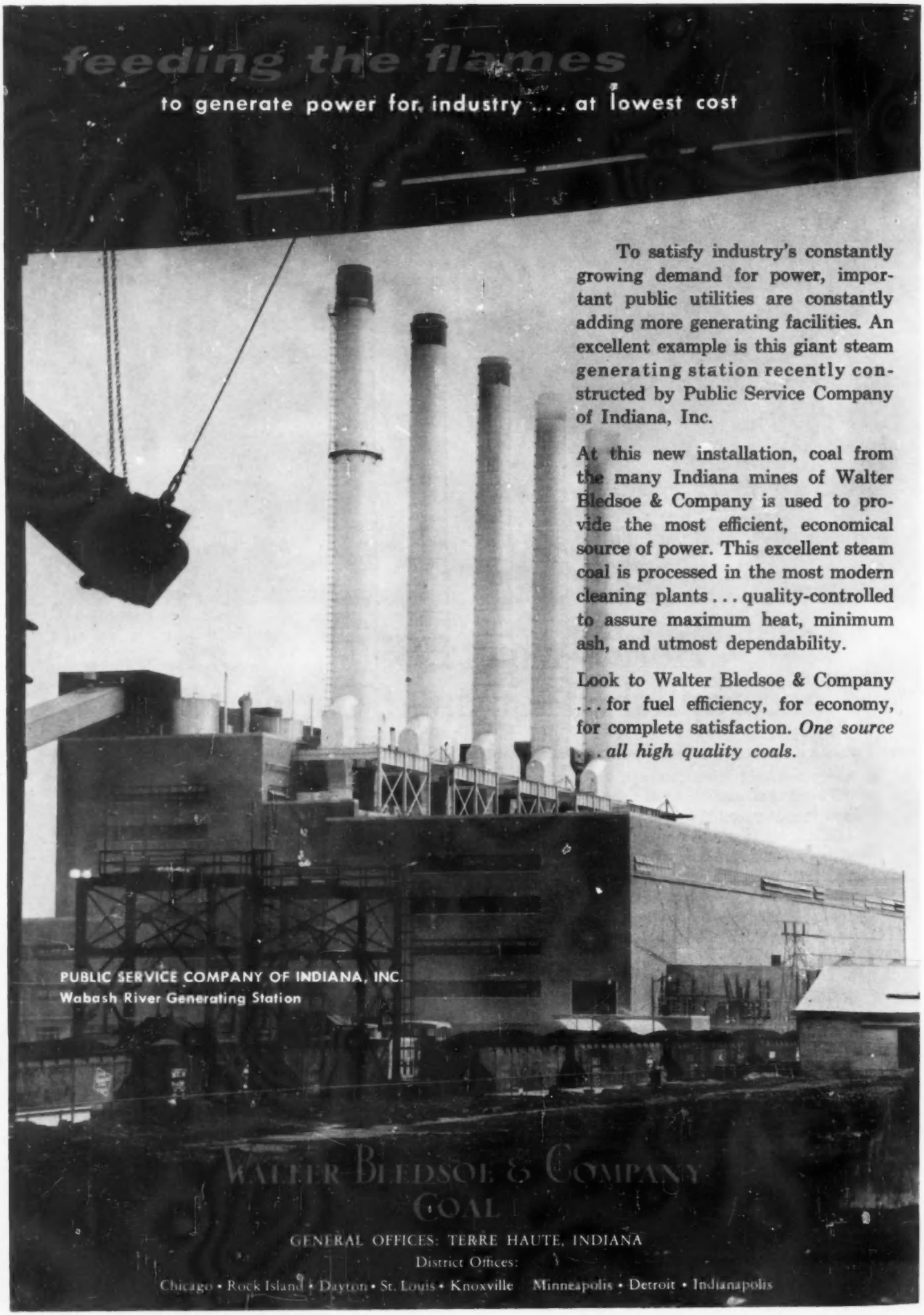

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results of all the alternatives determined. Finally, the decision matrix is constructed, which enables the executive to see all the alternatives and their results at once. The ultimate decision is still made by the executive, but by an executive who is aware of all the factors of the situation.

THE FUROR OVER DEALER FRANCHISES

CHARLES M. HEWITT

A GREAT deal of attention has been focused upon the recent rebellion of automobile dealers against their suppliers. In other industries too there has been dealer-manufacturer tension, and independent marketers have been feeling the effects of an increased emphasis on volume production.

Comparing franchised distribution in the automobile industry with that in other industries, Hewitt points out that in all fields both manufacturer and dealer problems are inherent in franchised distribution. Manufacturers must cope with antitrust questions and problems of dealer inertia; dealers, on the other side, handicapped by lack of knowledge of the basic features of their franchises, face difficulties arising out of certain franchise provisions.

On the other hand, franchises are not at all uniform. Typical automobile dealer franchises, for instance, are detailed; those for petroleum jobbers, much less so. And one major firm had no formal franchise until last year. Within industries, franchises tend to be similar—and in individual corporations they often are standardized. Features common to most franchise agreements are short-duration clauses, territorial restrictions, and indefinite obligations. Because of recent antitrust trials, however, there has been a trend away from exclusive-dealing stipulations.

Among the common franchise provisions that dealers object to are short-term duration and short-term cancellation clauses. To dealer objections, manufacturers argue that they must defend their investment.

In the automobile industry, the 1956 "good faith" bill represents a new approach to some of the franchise problems. Difficulties still must be met in other industries, however, and perhaps still different approaches tried.

IS THRIFT OUTMODED?

GROVER W. ENSLEY

PERSONAL savings are an important source of capital formation, and also serve as a curb on inflation. Ensley examines the current economic situation to determine whether or not Americans really have lost their desire to save.

Although many observers claim that social security, various types of insurance, retirement programs, and other provisions for security have left the American citizen without incentives to save, there is evidence that people still do *want* to save—and are saving.

Many argue that instalment buying has decreased the will to save; however, a University of Michigan survey found that those who bought on the instalment plan were also those who saved. Surveys have shown that the saving patterns of American families have changed little over the past six decades. Finally, net savings in 1956 were the highest since the war years.

Recent studies have indicated that people save best when they save for *something*—for cars, for college educations for their children, and so on. A Philadelphia bank has set up "special-purpose" accounts to make it easier for its customers to save. The success of this experiment might well encourage other savings institutions to adopt this technique for motivating the "instinct to save."

STABILIZING INCOME THROUGH INSURANCE

JOHN D. LONG

THE unpredictability associated with such situations as strikes, floods, and technological obsolescence has heretofore made these hazards uninsurable by ordinary means. However, a new type of insurance coverage called "chronological stabilization" insurance may actually be able to handle such situations better than the usual method of reserved earnings.

The theory behind "chronological stabilization" is that of long-run averaging. For example: Although the loss to one firm over many years because of strikes may not be predictable, the loss to many firms over many years because of strikes, floods, technological

obsolescence, and other contingencies can be predicted with reasonable accuracy.

This new method would have the advantages of making cost accounting figures more stable, and could eliminate much of the fluctuation from the annual income and net worth figures of firms. Contingency funds could be released for other uses. Finally, the insurance premiums might be tax-deductible, while contingency reserves now must be built up with after-tax dollars.

The present controversy over "chronological stabilization" insurance hinges on the problem of ratability of contingency losses. Many argue that such losses cannot be predicted with enough accuracy to make such insurance feasible. If, however, it is found that these losses *can* be predicted, then the case for "chronological stabilization" insurance will become stronger.

DECISIONS BEHIND THE EDSEL

J. EMMET JUDGE

EIGHTY per cent of the volume of the Ford Motor Company comes from their Ford car, and only 20 per cent from the Mercury and Lincoln. This is in sharp contrast to the 50 per cent of total volume received by General Motors and the Chrysler Corporation from their medium- and high-price cars.

Thus it was for good reasons that Ford decided to enter the medium-price field with their new Edsel. However, before the car could be introduced to the public, much research had to be done concerning consumer tastes, values, preferences, and buying habits. For this end, the Edsel Division used the services of three university research organizations: the Bureau of Applied Social Research of Columbia University, the National Opinion Research Center of the University of Chicago, and the Research Associates of the University of Michigan.

These groups were of great assistance in determining such factors as the "associations" made by customers to particular makes of cars, the extent of "owner loyalty," and the importance of dealer-customer relationships. Judge feels that the research done by these groups has been very helpful to the Edsel Division, and he recommends that other areas of business make more extensive use of academic research.

The Real Challenge of Research

By J. Irwin Miller

THE inventive capacity and mechanical inspiration of man has never been higher than it is today, and, therefore, in the next 15 years the businessman should anticipate and assume the rapid obsolescence of all his products and should endeavor through research to be, himself, the one who obsoletes them, realizing that whatever he is doing, whatever he is making, there is a better way of doing it and a better way of making it.

Today's businessman should also realize that research can be the most purely wasteful of all his business activities. If the head of a business indulges in research, as many do, just to solace his own fears of the future, and plays no personal part in this agonizing function, then he will only come to the end of his cycle all the sooner. If research is to be fruitful, it must be a major daily concern of top management, and, if it is to succeed, those who conduct the research must have a solid understanding of the true needs of their company, of its industry, and of its customers. Unless the top management of a company and its research staff are in the most constant and intimate kind of communication, research will amount to little and can be a great drain on any company.

Research, therefore, is a genuine "business risk," but it is one which must be undertaken. Despite all its perils, the truth remains that in this wildly imaginative technical world in which we find ourselves, a business manager should not sleep too easily at night unless he accepts the fact that there is a better way to do everything that he does and a better way to make everything that he makes, and unless he is determined, himself, to engage in disciplined effective research to obsolete his own ways and his own products.

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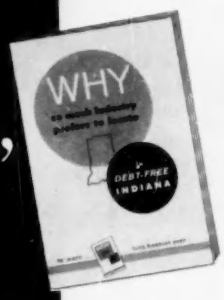

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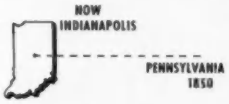

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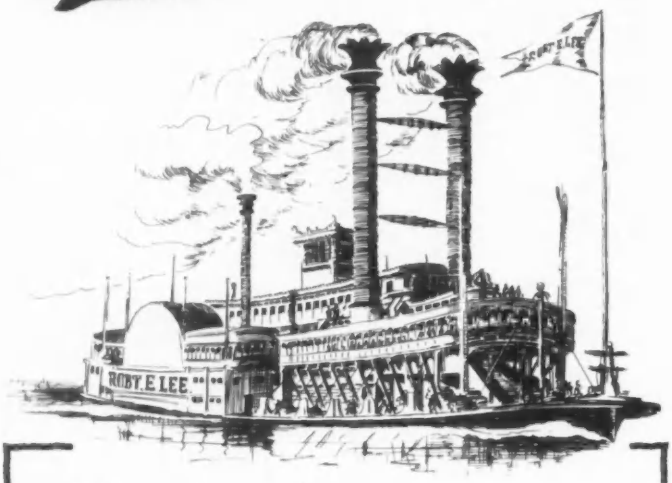

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Behind the Lines

THIS COLUMN is reserved mainly to tell you something about the authors who contribute to the current issue. But for our first volume we would like to preface that discussion with a brief summary of what we believe to be our audience and our mission.

BUSINESS HORIZONS is addressed to those who exercise or influence decision- and policy-making in our society. This is a select unit of readers—intelligent and thoughtful businessmen, teachers and advanced students of business administration. Scholars in our colleges and universities often pull themselves into little self-contained units and communicate fairly effectively with each other, but fail to communicate with decision-makers in business. Business leaders sometimes have had difficulty in drawing the best ideas from such groups, and, indeed, often from each other. There is frequent criticism that the ideas of executives are not properly understood by the academic group. In this new quarterly, the professor, the professional specialist, and the decision-maker have a two-way street for expression, in their own words, of their best thinking on the most urgent issues.

Immediate issues, rather than problems of the past, will direct the focus of BUSINESS HORIZONS. Sensitivity to newly recognized forces means early informed opinion, even though the very nature of these subjects means that they will often be dealt with before all the facts are in and all the answers final. Decisions and actions cannot wait for the last "t" to be crossed.

Complete agreement will scarcely be possible, under the circumstances. Indeed, the editors may disagree—perhaps strongly—with some of the conclusions which our authors will reach. But so long as a piece is well

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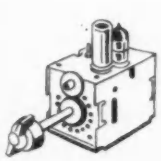

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reasoned and sets forth an important position or point of view on an issue relating to business, it may find a place in BUSINESS HORIZONS.

So that we may present our readers with the most important and most current areas of controversy, an advisory board has been selected to take part in implementing this program.

This board will consist of men from college and from industry, well qualified, both by virtue of the positions they hold and of the reputations they have gained for themselves, to fulfill their assignment.

The members of the board are:

- Robert C. Liebenow, who is President of the Chicago Board of Trade
- J. Irwin Miller, now serving as Chairman of the Board of Cummins Engine Company
- Herman C. Nolen, now President of McKesson & Robbins
- Eli Shapiro, now on leave from his professorship of Finance at Massachusetts Institute of Technology
- Donald B. Woodward, Chairman of the Finance Committee, Vick Chemical Company.

The assignment that these board members have been given is to help identify and isolate the salient areas of inquiry on the business horizon and to select the best thinking being applied to them.

Quite clearly, the first duty of the editors and the advisory board—to identify the major developments on the business horizons—is a challenging one. But equally important is their second responsibility—to locate minds highly qualified to make the studies and to write the reports in the respective problem areas.

The names of the authors chosen are testimony that the board has done a fine job.

Our Authors

Paul G. Hoffman possesses unique qualifications for writing on the various implications of *The New European Market*. His experiences and achievements as a businessman are, of course, well known. To be brief, besides heading the Studebaker Corporation, he has been Chairman of the Board for Studebaker, and in 1954 for Studebaker-Packard, as well as Chairman of the Board of Trustees, Committee for Economic Development. In addition, he has served as a Director of the Federal Reserve Bank of Chicago; the New York Life Insurance Company; Time, Inc.; United Airlines, Inc.; and Encyclopaedia Britannica, Inc.

Just as these business experiences eminently qualify Mr. Hoffman to discuss the business implications of the New European Market, his unusual responsibilities in international affairs have given him a special insight on the market itself. He has represented our government in many important ways, the best-known, perhaps, being Administrator, Economic Cooperation Administration.

A scholar who has made significant contributions in many phases of business and economics is Dr. T. N. Beckman, Professor of Business Organization at The Ohio State University. We will restrict ourselves here to mention of his work with quantitative problems, which dates back more than two decades. In the late 1920's and the early 1930's he was in charge of the Wholesale Census of Distribution. He served as a Consulting Expert for the Census of American Business in 1933-35. Among other important pieces of quantitative research in the 1930's is that done in connection with *The Chain Store Problem*. His consulting work has frequently included problems of quantification and measurement. In 1953 he entered the Hall of Fame in Distribution. Also in recent years Dr. Beckman has pioneered in *Value Added in Marketing*, which adds to his already fertile background for research and writing in the area of productivity.

Dr. Robert D. Buzzell, co-author of *Productivity, Facts and Fiction*, has recently completed an authoritative study on productivity under the direction of Dr. Beckman. This research has provided some of the important background for the article.

For information on today's electronic aids to business, we must rely on experts who are "ambidextrous"—adept in mathematics and electronics, as well as in business. Indiana University's Dr. E. W. Martin brings to his research a background of training in the field of mathematics, where he holds the Ph.D. degree, and a period of practical experience with the IBM Corporation, with whom he was associated from 1952 to 1956. Currently, as Associate Professor of Business Administration, he is teaching and doing major research relating to electronic data processing, with special emphasis upon the applications of electronic data computers to business problems.

Students of business associated with consulting firms are expected to make rather frequent appearance in BUSINESS HORIZONS. The first of this group on our pages are Roger E. Ball and Allan A. Gilbert, connected with George Fry & Associates, of Chicago, New York, and Los Angeles. Mr. Ball, as Senior Account Manager, and Mr. Gilbert, as Marketing Consultant, are both constantly working with problem solving activities. Their research

in this area, which has culminated here in *How to Quantify Decision-making,* is not only carefully conceived but also tested and applied.

Early associated with the Institute of International Finance, Dr. Harry C. Sauvain is now the chairman of the Indiana University School of Business Department of Finance. Dr. Sauvain, whose article is on the recent accumulation of debt, has also served as a member of the Faculty of the Graduate School of Banking, American Bankers Association and as Secretary, Indiana Commission for Financial Institutions. From 1940 to 1947 he was Director of the Life Officers' Seminar. His publications include *America's Experience as a Creditor Nation* (as a co-author) and *Investment Management.*

James B. Boulden has an unusual combination of training for work in sales forecasting. Holding a degree in civil engineering and a master's degree in economics, he has recently pursued management as a major area of study and has done advanced work in marketing, economics, and statistics. *Fitting the Sales Forecast to Your Firm* is a result of a research effort that has given him opportunity to draw upon all of these disciplines.

Consultation, a special feature of BUSINESS HORIZONS, is especially planned to bring together highly informed points of view on some important, timely problem facing business. The editors believe that the question of tax cuts by the 1958 Congress is one that merits examination at this time. Dr. R. C. Turner of our faculty was selected to edit and organize the current symposium. Seeking differing yet responsible points of view, he invited the following to participate:

- Emerson P. Schmidt, Economist for the U.S. Chamber of Commerce,
- Gerhard Colm, Economist for the National Planning Association,
- Robert R. Nathan, President of Robert R. Nathan Associates, Inc., for many years a prominent government economist.

Another permanent feature is *Technological Horizons,* a running discussion of current technological developments that we believe will be of special importance to the business executive and the student of business affairs. For this current issue Dr. Turner explains the differences between nuclear fission and nuclear fusion and appraises their future as important sources of energy. Dr. Martin discusses the newest developments in electronic computer equipment, including its application to business control.

Dr. Charles M. Hewitt has a unique background of training and experience to qualify him for research on franchise agreements. Problems of both economics and law must be resolved. Dr. Hewitt has a degree in law and a doctorate in business administration, economics being one of his areas for advanced study. During the past several years, Dr. Hewitt, an Associate Professor of Business Law at Indiana University, has carried on intensive research about the franchise problem. In 1956 he published *Automobile Franchise Agreements,* and currently his research, from which several of the observations in his present article are drawn, is taking him into the franchise problems of the oil industry and of many lines of durable goods.

The author of *Is Thrift Outmoded?,* Dr. Grover W. Ensley, is Executive Vice President of the National Association of Mutual Savings Banks. Over the years Dr. Ensley has held a number of responsible government assignments, all involving economic and public policy. In the early 1940's he was Research Economist for the Tax Foundation of New York City. He then became Fiscal Analyst for the U.S. Bureau of the Budget, and in 1947 was appointed Technical Advisor to Senator Ralph E.

> THE frontier has been a predominant influence in the shaping of American character and culture, in the molding of American political life and institutions; the frontier is the principal, the recurring theme in the American symphony. Whatever distinction we have as a people, whatever differentiates us from the other branches of Western European civilization we owe in large part to the presence of the frontier—its unappropriated wealth, its dangers and challenges. . . . The frontier liberated the American spirit. It developed generosity and radiant vitality, together with a restlessness which was both good and ill, but did certainly bring with it a resiliency of mind, fluidity of idea and of society, a willingness for bold experiment.
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> —*Clyde Kluckhohn*
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Flanders. He served as Executive Director, Joint Economic Committee, from 1949 until June 1, 1957.

Mr. J. Emmet Judge is Merchandising and Product Planning Manager of the Edsel Division of Ford Motor Company, in charge of planning the new Edsel line of automobiles introduced to the American public on September 4, 1957. Mr. Judge was the second man appointed to the Division, formed in April, 1955, which now numbers more than 1,800 employees. He supervised the market studies and the planning of the merchandising program for the new automobile. It is also the responsibility of his organization to provide over-all direction of the styling and engineering development for the Edsel.

Dr. John D. Long, C.L.U., C.P.C.U., the author of *Stabilizing Income through Insurance*, is Associate Professor of Insurance at Indiana University. His numerous writings include the articles "Replacement Cost Insurance," "Value Theory—and Buy-and-Sell Agreements," and "What is Life Insurance?"; the duograph, coauthored by A. M. Weimer, *Summary of Financing of College and University Student Permanent Housing* and the monograph *Methods of Agency Continuation*. Currently, Dr. Long is carrying on research to determine the place of the insurance company in the business organization.

The editors of BUSINESS HORIZONS are proud to bring you the thinking of these authors. We will not always agree with what our authors have to say, but we will respect their right to be heard and will see to it that their points of view are presented.

—Schuyler F. Otteson

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The *NEW* European Market

PAUL G. HOFFMAN

There is under way in Europe today an economic development of profound significance—a development that will not only fundamentally affect the economy of Europe but will have repercussions throughout the world. In March, 1956, the leaders of six European nations—France, Germany, Italy, Belgium, Holland, and Luxembourg—signed in Rome treaties to establish a European Atomic Energy Community (Euratom) and a European Economic Community (Common Market). These measures were approved last summer by decisive parliamentary majorities in Germany, France, and Italy, and ratification by the remaining countries is virtually assured. Both measures go into operation in January, 1958. I believe that this event, and particularly the advent of the Common Market, will be the most significant European development since the end of the war.

SEEN from the standpoint of Europe's economic history, the Common Market represents the culmination of a shift away from a long era of national protectionism that began as early as the 1870's. Spurred chiefly by the growth of nationalism and the desire to foster home industries, the Continental countries of Europe steadily increased their tariffs against each other's products. The process tended to be cumulative, for as one country raised its tariff others followed suit in retaliation. Nor was this trend confined to Europe. Indeed, with the exception of the short-lived 1913 tariff, United States duties became among the highest in the world.

Two world wars and an intervening depression intensified governmental restrictions on the flow of trade. After the first world war, European governments devised new and more drastic techniques to curb imports and to protect their foreign exchange holdings. Import quotas, licenses, and exchange controls were widely introduced to regulate not only the flow of goods but the movement of capital as well. The cumulative impact of this trend can be gauged by the fact that while Western European production rose by 70 per cent between 1913 and 1951, trade among these countries rose by only 2 per cent.

When the Marshall Plan was proposed in 1947, trade among the countries of Western Europe had been reduced to little more than a trickle. What trade there was took place largely through bilateral barter deals. Intra-European trade in that year was only 56 per cent of even the shrunken immediate prewar

level. Clearly, if America was to make available assistance for European economic recovery without excessive and unjustified cost, our effort had to be accompanied not only by individual self-help but by mutual cooperation among the European countries themselves. Hence, a basic policy of the Marshall Plan was the progressive elimination of barriers to the exchange of goods and services, and the stimulation of competition and specialization on a European-wide scale. This policy was written into the legislation in the following words:

> "Mindful of the advantages which the United States has enjoyed through the existence of a large domestic market with no internal trade barriers, and believing that similar advantages can accrue to the countries of Europe, it is declared to be the policy of the people of the United States to encourage these countries through a joint organization to exert sustained common efforts . . . which will speedily achieve that economic cooperation in Europe which is essential for lasting peace and prosperity."[1]

In our administration of the Marshall Plan we kept constantly in mind this basic need to increase intra-European trade and payments. We introduced a number of measures designed to help our European partners toward this goal. One was the Trade Liberalization Program undertaken by the OEEC (Organization for European Economic Cooperation) to progressively remove import quotas and licenses on trade among the European nations. A second was the establishment of the EPU (European Payments Union) through which each nation could more readily transfer credits earned on trade surpluses with one member to pay trade deficits with another. Thanks in large part to these undertakings, European production and intra-European trade began to climb. Between 1948 and 1952, Western Europe's gross national product increased by 25 per cent and intra-European trade by 73 per cent.

The economic recovery and cooperative measures initiated by the Marshall Plan created a momentum in Europe that has led to a bolder and more far-reaching program for Continental unification. Its objectives went considerably beyond economic goals alone: Integration was also a means to bury Europe's historic rivalries, to enrich her cultural heritage, and to give her a stronger, more self-reliant role in the councils of world affairs.

The first major result of this movement was the European Coal and Steel Community—the Schuman Plan—proposed by France in 1950 and established in 1952. The Schuman Plan differed from earlier integration measures in three major respects.

¶ First, it concentrated on one basic sector of economic activity—coal and steel.

¶ Second, it provided for common executive, parliamentary, and judicial institutions with independent authority to act in the interest of the Community as a whole.

¶ Third, it involved a smaller group of nations that were prepared to move forward rapidly—the six Continental powers mentioned above.

Great Britain, whose leadership had been eagerly sought, was conspicuously absent.

Operating from its headquarters in Luxembourg, the Schuman Plan has abolished virtually all frontier barriers on trade in coal and steel within the Community, has eliminated many hidden restrictions such as discriminatory freight rates and subsidies, has assisted firms and their employees in adapting to conditions of increased competition, has taken action against cartels, and has promoted the expansion of efficient productive capacity. The results have been remarkable. Aside from record increases in production, part of which can be attributed to the general economic upsurge, trade in coal and steel within the Community increased by 93 per cent between 1952 and 1955, as compared with a 59 per cent increase for other products. The Schuman Plan has provided a working demonstration of the benefits of an integrated mass market for heavy industry.

[1]Economic Cooperation Act, 62 *U. S. Stat. at L.*, 137 (1948).

Concurrent with the drive for European economic integration came an effort in the field of defense. In 1950 Communist aggression in Korea gave impetus to a stepped-up defense program to reinforce NATO. German troops would be added to the strength of the West through a European Defense Community in which the six Schuman Plan nations would unify their armed forces and defense efforts. Signed in 1952, the European Army treaty also envisaged a semifederal European political authority and a popularly elected Assembly. Thus the major nations of Continental Europe appeared to be on the threshold of military and political unification when, in August, 1954, the French Parliament rejected the treaty and thereby dealt a deathblow to both efforts.

This collapse jeopardized not only European unification but the whole basis of Western defense. Thanks to rapid and skillful diplomacy, in which Britain played a leading role, the threat to NATO was averted. Under the Paris Agreements of 1954, Germany was brought into the NATO camp with the right and duty of limited rearmament. A new organization, the "Western European Union," was set up by Britain and the six Continental countries to plan and supervise their national armaments, particularly Germany's. But this organization, despite its name, involved little merging of authority and responsibility. And, in contrast to the EDC plan, it did not provide a basis for integration in other fields. Many felt that the movement for European unity—and the bright promise it held for Europe's future—had foundered for good.

This might well have been so had it not been for the determination and vision of men like Paul Henri Spaak, Jean Monnet, Konrad Adenauer, and Robert Schuman. Temporarily laying aside plans for military and political unity, they turned to the economic field where the Schuman Plan had pioneered so successfully. This new effort, known as "the new drive for European union," got under way in mid-1955 at three levels—official, parliamentary, and private.

Meeting at Messina, Italy, in June, 1955, the governments of the six Schuman Plan countries set forth the broad objectives of the new drive and appointed Spaak as chairman of a committee to draw up detailed official proposals. The committee's proposals were adopted by the governments in April, 1956, and became the basis for Euratom and the Common Market, treaties for which were subsequently negotiated under Spaak's leadership.

Meanwhile, parliamentary support for these objectives was being mobilized by Jean Monnet, who resigned as Chairman of the Coal-Steel High Authority to form an "Action Committee for the United States of Europe." Monnet's Action Committee, which includes the key leaders of the democratic parties and trade unions within the six countries, has played a little publicized but crucial role in spurring the governments forward and in paving the way for parliamentary approval.

Finally, at the nongovernmental level, a program of public information was initiated by the European Movement—the association of citizen groups working for unity—which in the past has been led by Robert Schuman. With encouragement and some financial assistance from the American Committee on United Europe, the European Movement's campaign of public meetings, radio programs, youth activities, research, and publications has done much to create a climate of European opinion favorable to the aims of the new drive.

This three-pronged effort is scheduled to culminate in January, 1958, with the advent of Euratom and the Common Market. European leaders with whom I have talked agree that with the imminent adoption of the Common Market, Western Europe stands on the threshold of a second industrial revolution. A brief description of the treaty's highlights is therefore in order.

First and foremost is the creation of a single, competitive, mass market comprising over 160 million people. The six nations will gradually but totally eliminate, over a period

of not more than 12 to 15 years, all tariffs and quotas on all trade among themselves. The progressive elimination of tariffs and quotas is irreversible and must be completed by the end of the transitional period. However, any member may move ahead more rapidly, and many European leaders believe these restrictions will be virtually eliminated well before the deadline. Other barriers to trade and competition—such as discriminatory freight rates and distortions caused by governmental regulations—within the area will also be reduced or eliminated. "Antitrust" actions by the Community are authorized against private agreements or monopolies in restraint of trade.

2 Restrictions on the free movement of labor and capital within the area will be eliminated or curbed. By the end of the transitional period all workers will have the right to accept job offers in any member country, regardless of national frontiers. This provision is particularly significant for Italy with its unemployment problem. As regards capital, payments will be liberated in step with the removal of obstacles to the movement of goods, services, and labor. Barriers to investments that interfere with the functioning of the Common Market will be progressively eliminated.

3 A measure of integration will be extended to the field of agriculture. Tariffs and quotas on agricultural products will be gradually eliminated, subject for a time to national price support systems. Meanwhile, a common agricultural program will gradually supersede national programs and take full effect by the end of the transitional period. Price supports and other controls are likely to continue but will be placed on a Community-wide basis, allowing greater scope for increasing agricultural specialization, productivity, and income.

4 Going beyond the removal of negative economic restrictions, the treaty provides for positive action to stimulate industrial and regional development. A European Investment Bank will be established with a capital from state contributions equal to $1 billion and authorized to lend or guarantee loans up to an equivalent of $2.5 billion. The Bank will finance the development of underdeveloped regions within the Community—particularly southern Italy and Sicily—and large public projects involving two or more states.

5 To prevent dislocation and enable a smooth adjustment to increased competition, the treaty provides a number of shock absorbers. First of all, the transition will be gradual and highly predictable, taking place in three stages over the 12-15 year period. Businessmen will be able to plan ahead. For those plants finding themselves in difficulty, the Investment Bank will help to finance modernization or conversion costs or the establishment of new concerns if local finance is not available. Finally, the governments will contribute to a Social Fund to share in the expense of unemployment benefits and retraining or resettlement costs for workers of submarginal enterprises.

6 The Common Market will give rise to a new trading unit with the outside world. Over the 12-15 year period, a common external tariff will gradually replace national tariffs on imports from nonmember nations. In general, the external tariff will be the average of those of the four customs units involved—France, Germany, Italy, and Benelux. Averaging out the external tariff will mean duty increases for some countries, particularly Benelux, and lowerings for others, especially France and Italy. Some duties have been fixed by direct negotiation but

the ones fixed below the average—notably on raw materials and semimanufactured products—are as important as those set above it. Moreover, the treaty permits members to suspend their duties or apply tariff quotas on virtually all foreign agricultural imports so long as this does not seriously disturb the internal market. Hence, the Common Market countries are not freeing trade among themselves at the expense of trade with the rest of the world. Much has been done to recognize and take into account the export interests of other countries.

7 Machinery for carrying out these sweeping measures will consist of a council, a commission, a parliamentary assembly, and a court. Principal responsibility will rest with the executive bodies, the council, and the commission. The six-member council, representing the individual governments, will exercise final decision on most questions arising under the treaty. It will also have the equally important task of coordinating the economic policies of the member states both among themselves and with the Community's own policy. In most cases the council will act by unanimous vote during the first four to six years and by qualified majority thereafter. The nine-member commission, appointed by the governments on the basis of personal competence and independence, will be responsible for the interest of the Community as a whole. Acting by simple majority, it will apply the provisions of the treaty and the decisions of the council. But the commission is not merely an administrative agent. In nearly all cases the power of initiative rests with the commission. It must present its proposals to the council before the latter can act. Moreover, the council can revise the commission's proposals only by unanimous decision. The juxtaposition of the two bodies gives rise to the possibility of deadlocks. There will be need for mutual accommodation and good will. The experience of the Schuman Plan, which has a similar structure, shows not only that close cooperation is possible but that the commission can be expected to help resolve—in the Community's interest—disagreements within the council itself.

Although space does not allow discussion of other features of the treaty, the provisions on overseas territories, for example, it should be clear that the Common Market goes far beyond a traditional customs union. It will lead to a new economic community with common rules of competition, a common labor force, a central investment fund, and joint institutions of considerable authority. It stops short, however, of a full economic union wherein members merge their budgets, centralize their banks, and adopt a common currency. Each nation retains control of its economic, fiscal, and credit policies. A recurrent inflation or a severe depression, particularly in one of the larger member countries, could cause trade and balance-of-payments dislocations that would undermine the Common Market. But the pressure of competition and the influence of common institutions will be powerful stimulants toward that close coordination of economic policies to which the governments pledge themselves under the treaty.

THE DRIVE to establish a Common Market has, in turn, given rise to a highly desirable concurrent development that may extend the single market to an even wider circle of Western European countries. Facing the advent of a prosperous community developing in their midst and ringed by an external tariff, the other OEEC countries, led by Great Britain, have proposed the creation of a Free Trade Area in which they could participate as full or partial members. Under this proposal, tariffs and quotas on trade among the participants, including the Common Market group, would gradually be eliminated at much the

same pace as that scheduled in the Common Market treaty. In effect, the single market would be broadened to include Britain, Sweden, Denmark, Norway, Austria, and Switzerland—the countries most likely to be full members—whose combined population would add nearly 80 million consumers to the 160 million of the Common Market. An outer ring of countries—Ireland, Iceland, Portugal, Greece, and Turkey—would probably associate on a more limited basis.

There are several important differences between the terms of the Free Trade Area, as originally proposed by Britain, and those of the Common Market. The Free Trade Area would be a looser, less comprehensive arrangement. Liberation of trade within the area would not be accompanied by the creation of a common tariff on imports from outside. Each member would retain its own external tariff. Britain also wishes to exempt agricultural products from the Free Trade Area. This would enable her to maintain the present system of Commonwealth preference whereby British manufactured goods receive tariff concessions in the Commonwealth markets and Commonwealth agricultural products are admitted duty-free or at low rates in Britain.

Negotiations on the Free Trade Area have been proceeding in the OEEC since last February. The slow progress to date is partly due to the desire of the Common Market countries to concentrate on completing their own arrangement and assuring its ratification. But there are also real difficulties in squaring the proposed Free Trade Area with the Common Market.

One is the exemption of agriculture, which runs contrary to the interests of a number of European nations exporting agricultural products.

Another is the absence of a common external tariff to prevent the free circulation of foreign goods entering a low-tariff member of the area.

A third is the discrepancy between the commitments already assumed by the Common Market countries and those envisaged for members of the Free Trade Area.

The latter neither covers so broad a range of economic activities nor provides so great a transfer of national responsibility.

The outcome of these issues is not yet clear. Undoubtedly the Free Trade Area plan will be modified to reflect more fully the varied interests of the parties. But my recent conversations with leaders on both sides of the English Channel convinces me that, in one way or another, these difficulties can and will be resolved. The desire of British leaders not to see their country remain outside the Common Market is matched by their understanding that Britain must exercise positive leadership in the construction of a broader European association. And on the Continent there is great hope that this leadership will be forthcoming and that Britain will play an increasingly important and intimate role in the affairs of Western Europe. The recent resumption of the OEEC negotiations, thanks to Britain's initiative, is a promising indication that this hope will be fulfilled.

THE DEVELOPMENT of a European market will provide increasing economic opportunities both within Europe and for non-European countries including the United States. The elimination of internal barriers will enable European manufacturers to compete directly with one another, to realize economies of large-scale production, and to specialize according to natural advantage. As productivity and competition increase, employers will be able to sell at lower prices and pay higher wages with a resulting expansion in sales, production, employment, and income.

The initial effect will undoubtedly be a rapid growth of European production and intra-European trade. But this in turn will give rise to added demand for non-European imports and, from America, for private capital as well. All the precedents point in this direction. The trade liberalization program of the OEEC, which at first stimulated trade within the area, later resulted in a growth of imports from the rest of the world.

Similarly, record trade and production increases in the European Coal and Steel Community have been accompanied by a rise in steel imports. The European market, already America's best overseas customer, promises to be an even better one.

This will be particularly true for American raw materials and for the foodstuffs that comprise a large part of America's exports to Europe. Rising standards of living and increased production are bound to create further demand for these products, not only from America but from the rest of the world as well. Gains in the export of consumer products and capital goods can also be expected in the long run despite the fact that American manufacturers will be competing against tariff-free European products. Rising per capita income and the need for American industrial machinery should assure this. The situation will vary from industry to industry, but declines in some markets are almost certain to be more than offset by gains in others.

The most powerful limiting factor on the expansion of American exports is not likely, however, to be the European tariff but the shortage of dollars at the disposal of European buyers. If we wish to seize the export opportunity offered by the European market, we must follow through on our own tariff liberalization program through the General Agreement on Tariffs and Trade (GATT) and the proposed Organization for Trade Cooperation (OTC). As Europe gains in productivity and efficiency, her ability to earn dollars through exports to America will likewise increase. By encouraging this trend we enable not only the American exporter and manufacturer but the American consumer as well to benefit from the European market.

The European market will undoubtedly lead to a large expansion of private American investment in Europe. As internal barriers decline, American companies will find it increasingly profitable to hurdle the external tariff by building or buying plants in Europe. A number of companies are already making just such plans. This will contribute further to the growth of production, employment, and income in Europe. It will also add a valuable source of dollars to ease Europe's present shortage.

But the implications of the European market go far beyond the economic field alone. They have a direct bearing on the fundamental issue of our time: the struggle between Western freedom and Eastern despotism. A basic element in the Kremlin leaders' plan for world conquest was their program to surround Russia by a ring of satellite countries whose people were not only willingly subservient to Moscow but also dedicated to the philosophy of communism. This dream was shattered by the stirring events in Poland and Hungary of last winter. An underlying reason for Moscow's failure was that the people of the satellite countries could look across the dividing line and see for themselves that the people of Western Europe were not only enjoying better lives—with freedom of worship, vote, and expression—but making a better living as well. They could see for themselves the falseness of communism's portrayal of Western society and its standard of living.

The coming of the European market offers an opportunity not only to maintain this differential between Western and Eastern Europe but greatly to increase it. So long as the people of Western Europe pursue their present course, the satellites will never willingly accept communism or Russian rule.

The present atmosphere of confusion about productivity must be cleared up. What is the tie-in between wages and productivity? Are the gains in productivity increasing?

PRODUCTIVITY: Facts and Fiction

THEODORE N. BECKMAN AND ROBERT D. BUZZELL

PRODUCTIVITY was recently given the apt designation "hot new issue" by *Business Week*.[1] Once restricted to discussions in college economics classrooms, productivity has now come to the forefront as a political and practical economic question of considerable importance. Unfortunately, because productivity *is* a hot issue, more heat is being generated than light. Not only are the statistics on productivity in dispute, but the very meaning of the term is obscured by the claims and counterclaims in circulation.

Although there is considerable controversy on the subject, everyone concerned with it seems to agree on one thing: Productivity is one of the most important concepts of applied economics. Patriots boast of the United States as the country with the highest productivity in the world; businessmen point with pride to their real and imagined accomplishments in this area. Labor leaders justify demands for higher wages in terms of alleged productivity increases. President Eisenhower, his Council of Economic Advisers, and the Congressional Joint Economic Committee have all made public statements on the subject in recent months. Just as everyone is against sin, so everyone seems to be for productivity.

Just what is productivity?

Why is it so important?

Clear answers to these questions are difficult, if not impossible, to find in the discussions which have been appearing with increasing frequency in the general press as well as in trade and professional periodicals. Examination of the statements of business executives and labor and political leaders reveals great confusion and disagreement. Confusion exists, in the first place, as to the basic meaning and nature of the productivity concept. For example, productivity is sometimes unfortunately confused with "production" or "output." Some writers reveal a basic misunderstanding by asserting or implying that productivity is in itself a good thing. This, of course, ignores the fact that it can be high

[1] "Productivity—The Hot New Issue" (March 9, 1957), pp. 25-26.

or low, just as profits or wages can be high or low, and that low productivity is anything but good.

Even those who agree on the nature and substance of productivity frequently disagree on proper ways of measuring it. This was brought clearly into focus during the recent Joint Economic Committee hearings, in which several conflicting estimates of the increase in productivity in 1956 over 1955 were presented. These differences, which not even the experts were able to resolve, arise from the differing measurement techniques used.

Finally, granting agreement as to the meaning and proper methods of measuring productivity, disagreement would still exist on the interpretation of the data and the conclusions drawn.

MEANING AND MEASUREMENT OF PRODUCTIVITY

Much, if not most, of the confusion about productivity arises from definition. Admittedly, precise definition of the productivity concept is a difficult task and this concept cannot readily be translated into laymen's language. As if this were not enough, development of proper techniques for measuring productivity is still more complex. Nevertheless, some agreement must be reached on a definition of productivity and on a general approach to productivity measurement before any meaningful analysis can be attempted.

Productivity Defined

Productivity is a ratio of *output*, or the results of production, to the corresponding *input* of economic resources, both during a given period of time. Problems of definition arise for both output and input, as well as for the scope of a given productivity ratio. A proper concept of output includes all goods *and services* that have market value and that are created through the process of production. This includes the values created by marketing and by the "service industries" as well as those created in the extractive industries and in manufacturing. Input, on the other hand, includes all of the factors of production expended or employed in creating output; these are labor, management, capital, land, and (from the viewpoint of a business enterprise or an industry) also government.

Problems of Measurement

The technical problems of productivity measurement center around the definition of stable, meaningful units of output and input. In very narrow productivity measures that apply to some specific task within a business, these problems do not pose major obstacles. The output of a routine clerical employee, for example, is readily measured in terms of units of work turned out such as invoices or checks prepared. Input, for the sake of simplicity, consists of hours of labor and equipment used. Since the equipment (capital) factor probably remains unchanged over a considerable period of time, changes in productivity are reflected in increases or decreases in the number of units of work produced per clerk man-hour. This type of measure forms the basis for most piece-rate systems of compensation for routine factory workers.

Real problems of output and input measurement are encountered when dealing with the productivity of a business enterprise as a whole, an industry, or an economy. The "output" of an enterprise may consist of many different kinds of goods and services which, together, form the *end product* sold in the market. How can these different classes of output, which differ greatly in relative importance, be combined into any single overall measure? The only feasible way is by means of a monetary common denominator. But monetary units do not remain stable, being subject to changes in the value of money itself. Some kind of adjustment must, therefore, be made in monetary output measures, usually by means of an appropriate price index. This, in turn, leads to further complications. One of the most important is that most so-called real output measures (adjusted for price changes) exclude changes in the quality

of products. Thus, for example, a 1957 automobile is regarded as equivalent to a 1940 automobile. While this obviously leads to distortions in output measures, there is no way to discriminate between quality changes and price changes per se under presently available techniques.

With regard to input, the problem of combining different classes of resources is even more complicated, for at least two major reasons. First, it is not possible or practical to combine the several factors of production in physical terms. Man-hours of labor cannot be added to acres of land, or to units of delivery equipment, any more than men's suits can be added to oranges in the output measures. Moreover, the same monetary common denominator cannot be used as in the case of output, partly because there is no single price index for labor, capital, rent, and other factors of production. For this reason, output usually must be related to each of the various factor inputs (labor, capital, and so on) separately in a series of productivity ratios rather than all at once in a single, over-all measure. But, when this is done, there is the problem, almost insoluble at present, of determining the contribution of each factor to changes in productivity when all factors are to be combined into a single measure or index—the so-called total factor productivity.

IMPORTANCE OF PRODUCTIVITY

The importance of productivity arises primarily from its relationship to the general standard of living, or, more properly, to the *level of consumption*. It is one of the few issues on which leaders of labor, management, and government are in full agreement, namely, that in the long run living standards depend on the efficiency with which our economic resources are utilized. This is readily illustrated by reference to a "Robinson Crusoe" economy of the type described in many elementary economics textbooks. Suppose that the one-man labor force of such an economy devoted his efforts entirely to the cultivation of potatoes. His standard of living would then be determined by the quantity of potatoes produced. This, in turn, would depend on

- the number of hours worked,
- the output per hour, or his productivity.

Since there is a definite limit on the number of hours which could be worked and since some leisure time is desired or essential, productivity or the rate of production per unit of time by the one man determines his standard of living.

In a complex industrial economy, the connection between productivity and living standards is basically the same as it is in a Robinson Crusoe economy. As goods and services are obtained through exchange, however, the relationship becomes an indirect one in which changes in productivity affect living standards through their effects on wages and other distributive shares, hours of work, and prices.

Wages and Other Distributive Shares

Since productivity is a relationship between output and factor input, it follows that the level of productivity is basically important in determining the rates of compensation of the various factors of production, namely, the wages of labor (including managerial labor), the rent of land, and the rate of interest on capital (including the rate of return on invested capital).

Because labor is quantitatively the most important class of factor input, the association between productivity and wages has been of particular interest. Increasing attention is being paid to productivity trends in bargaining between labor and management. Productivity-wage relationships also affect the general price level, hence public and governmental attention is focused on the subject. Inevitably, the accuracy and significance of productivity statistics have become topics of heated controversy. Actual use of the data for purposes of wage determination, however, appears to be quite limited. More often, the interests of the parties involved seem to lie in

converting productivity figures into justification for specific wage or price increases.

The importance of productivity-wage relationships was further pointed up by the policy adopted by the Wage Stabilization Board during the Korean War period. The Board sought to confine additional wage payments, especially of the incentive type, to payments that would not be inflationary, and justification in terms of productivity gains was regarded as a valid ground for allowing wage raises. In one case in which one of the authors served as consulting economist, a substantial employee bonus was allowed only on the basis of the increased productivity of the company involved and the demonstrated direct relationship between productivity and incentive payments. The Board, in adopting such a policy, was simply applying a principle well known to economists: As long as increases in the compensation of factors of production are offset or more than offset by productivity increments, they are not inflationary; but if they exceed the added productivity, prices will tend to be raised correspondingly. This leads to a consideration of the general relationship between productivity and prices.

Prices

As suggested by the preceding discussion, productivity and rates of compensation to the factors of production have a joint effect on prices. This has been recognized by President Eisenhower, who declared that "Wage increases that outrun productivity . . . are an inflationary factor. They make for higher prices."[2] Current concern over "creeping inflation" has made productivity a political issue of more than passing significance.

Available information on wage and productivity trends clearly indicates that increases in *money* wages have greatly exceeded gains in output per man-hour in the postwar period. In manufacturing, average hourly earnings increased by 60.1 per cent between 1947 and 1956 while output per man-hour increased by only 30.1 per cent.[3] This disparity may, however, be interpreted in at least two ways. One school of thought holds that wage increases in excess of productivity gains *cause* price increases through the pressure of unit labor costs on profit margins. This line of reasoning, of course, suggests that labor unions with their demands for higher wages are the villains of the inflationary cost-price spiral. On the other hand, labor leaders defend wage demands as necessary to maintain workers' living standards in the face of rising prices. Which precedes which is not always easy to determine, since the cause-and-effect relationship may be indirect—as when prices are raised in contemplation of anticipated wage increases certain to come shortly thereafter at the expiration of a labor contract.

Since average hourly compensation (including fringe benefits) *in constant dollars* increased by only 32.6 per cent between 1947 and 1956, it would appear that real wages have just about kept pace with productivity trends. Unfortunately, all of these figures represent *average* wage and productivity increases and cover only manufacturing industry. Because the pattern of changes in money incomes is uneven, with many segments of the population not sharing in the higher wages, many real incomes have suffered during the period in question.

In addition to its influence on wages, profits, and prices, productivity is of great importance in business management as a measure of the effectiveness of performance. Appropriate measures are used in many progressive concerns today, and will probably come into still wider use, for this purpose. Such measures are also useful for planning input requirements relative to known or predicted levels of output. Ratios of output to labor input, for example, are useful in determining the size and composition of the labor force needed to operate a plant, store, or warehouse.

[2] "Productivity—The Hot New Issue," p. 25.

[3] Average hourly earnings of nonsupervisory workers were $1.237 in 1947 and $1.980 in 1956. (Joint Economic Committee, "Economic Indicators" [Washington: 1957], p. 31.) For productivity data, see table 2.

PRODUCTIVITY TRENDS IN THE UNITED STATES

Before examining some of the current misconceptions about productivity, it is necessary to establish what the facts of the matter are. As Al Smith was accustomed to say, "Let's look at the record."

Measures of output, input in terms of man-hours of labor, and productivity in the same terms are presented in Tables 1, 2, and 3:

first, for the economy as a whole;

second, for all manufacturing industries;

third, for the automobile manufacturing industry.

In Tables 1 and 2, the data cover the period 1929 through 1956. No information for earlier years is shown, because statistics of output and input prior to 1929 are of doubtful accuracy at best. In Table 3, only the post-World War II period is covered for the same reason. In each case, the tables show year-to-year changes in output per man-hour as well as average annual changes for specified periods.

For the entire period 1929 through 1956, the average annual increase in productivity was 2.4 per cent for the economy as a whole and even less (2.0 per cent) for all manufacturing. The 27-year period is conveniently divided into three subperiods for purposes of analysis:

- the prewar period, 1929 through 1941;
- the war and reconversion period, 1942 through 1946;
- the postwar period, 1947 through 1956.

Average annual rates of change have also been computed for the last five years of the period, 1952 through 1956, showing our most recent experience.

With respect to the economy as a whole, output is measured in terms of private gross national product at constant (1947) prices per man-hour of labor. The *prewar* average annual gain of 2.6 per cent (which was identical for the entire economy and for manufacturing) differs but slightly from the *postwar* average of 2.7 per cent. During the war and reconversion period, however, the average increase per annum fell to 1.5 per cent. This is to be expected, since during the war marginal types of labor were used, obsolescence of capital equipment was retarded, and long hours, including substantial overtime, were worked. These factors had an even greater impact on manufacturing, where productivity actually *fell* by an average of 1.6 per cent annually between 1942 and 1946.

In manufacturing, the postwar rate of increase in productivity exceeded the prewar average considerably, 3.2 per cent as compared with 2.6 per cent between 1929 and 1941. The upward trend after 1946 is presumably explained by greater mechanization in manufacturing than in other segments of our private economy, but the data are by no means clear on this point. Since 1952, manufacturing output per man-hour has increased by only 2.7 per cent annually, despite the fact that "automation" has been introduced largely during that time.

Further doubt on the efficacy of automation to date in increasing productivity is raised by the data for the automobile manufacturing industry shown in Table 3. Since this is a highly mechanized industry, and since it is the industry in which the word "automation" was originally coined, one would expect much greater productivity gains here than in other industries. Instead, just the reverse is indicated. From 1947 through 1956, output per man-hour in automobile manufacturing gained by 2.8 per cent annually, well below the rate for all manufacturing (3.0 per cent) and still lower than that for the economy as a whole (3.2 per cent), both for the same period of years. Furthermore, the rate of increase in the automobile industry *fell* after 1952, with the annual gain declining to 2.0 per cent. These data suggest that the presumed effects of "automation" on productivity have not as yet materialized and that there may be some offsetting influences at work worth investigating.

One more general point may be made before specific productivity fallacies are described. It has been assumed by many that

TABLE 1

Real Private Gross National Product per Man-Hour of Labor 1929-56

Year	Private Gross National Product in 1947 Dollars		Number of Man-Hours[2]	Output per Man-Hour	
	Amount[1] (billions)	*Per Cent Change*	*(billions)*	*Amount[3]*	*Per Cent Change*
			PREWAR PERIOD		
1929	$142.3	...	113.5	$1.254	...
1930	127.8	−10.2	105.0	1.217	−3.0
1931	119.1	− 6.8	95.2	1.251	+2.8
1932	100.3	−15.9	83.8	1.196	−4.4
1933	95.6	− 4.6	81.8	1.169	−2.3
1934	103.9	+ 8.7	81.3	1.278	+9.3
1935	117.6	+13.2	85.8	1.371	+7.3
1936	130.3	+10.8	92.3	1.412	+3.0
1937	142.1	+ 9.1	98.0	1.451	+2.8
1938	133.6	− 6.0	89.7	1.489	+2.6
1939	145.0	+ 8.5	94.5	1.535	+3.1
1940	158.6	+ 9.4	98.5	1.610	+4.9
1941	181.7	+14.6	107.1	1.697	+5.4
			WAR AND RECONVERSION PERIOD		
1942	198.7	+ 9.4	116.7	1.704	+0.4
1943	209.0	+ 5.1	120.9	1.729	+1.5
1944	222.0	+ 6.2	120.0	1.850	+7.0
1945	218.0	− 1.8	114.0	1.912	+3.4
1946	211.2	− 3.1	116.1	1.819	−4.9
			POSTWAR PERIOD		
1947	215.6	+ 2.1	120.0	1.796	−1.3
1948	227.3	+ 5.4	120.8	1.882	+4.8
1949	224.0	− 1.5	115.2	1.945	+3.3
1950	246.6	+10.1	118.0	2.090	+7.5
1951	259.9	+ 5.4	123.7	2.101	+0.5
1952	268.9	+ 3.5	124.6	2.158	+2.7
1953	280.7	+ 4.4	126.3	2.222	+3.0
1954	277.3	− 1.2	122.7	2.260	+1.7
1955	299.0	+ 7.8	127.0	2.354	+4.2
1956	308.0	+ 3.0	129.8	2.373	+0.8
Average Annual Per Cent Change:*					
1929-56		+ 3.2			+2.4
1929-41		+ 2.6			+2.6
1942-46		+ 3.2			+1.5
1947-56		+ 3.9			+2.7
1952-56		+ 3.5			+2.5

* *Simple averages of percentage changes.*

SOURCES: [1] *Computed from data in Office of Business Economics, U.S. Department of Commerce,* SURVEY OF CURRENT BUSINESS *(July, 1957), pp. 24-25, table 40.*

[2] PRODUCTIVITY, PRICES, AND INCOMES, *materials prepared for the Joint Economic Committee by the Committee Staff (Washington: 1957), p. 91, table 5.*

[3] PRODUCTIVITY, PRICES, AND INCOMES, *except as revised for certain years in light of revised data on private gross national product in 1947 dollars.*

TABLE 2

Output per Man-Hour of Labor, All Manufacturing 1929-56

(Index Numbers, 1947-49 = 100)

Year	Manufacturing Output[1] (Col. 1)	Man-Hours[2] (Col. 2)	Output per Man-Hour	
			Index[3] (Col. 3)	Per Cent Change[4] (Col. 4)
PREWAR PERIOD				
1929	58	78.1	74.3	----
1930	48	66.4	72.3	− 2.7
1931	39	54.5	71.6	− 1.0
1932	30	43.7	68.6	− 4.2
1933	36	46.4	77.6	+13.1
1934	39	48.5	80.4	+ 3.6
1935	46	54.7	84.1	+ 4.6
1936	55	63.5	86.6	+ 3.0
1937	60	68.7	87.3	+ 0.8
1938	46	55.3	83.2	− 4.7
1939	57	63.8	89.3	+ 7.3
1940	66	68.9	95.8	+ 7.3
1941	88	88.4	99.5	+ 3.9
WAR AND RECONVERSION PERIOD				
1942	110	108.3	101.6	+ 2.1
1943	133	131.0	101.5	− 0.1
1944	130	129.8	100.2	− 1.3
1945	110	111.4	98.7	− 1.5
1946	90	98.0	91.8	− 7.0
POSTWAR PERIOD				
1947	100	103.7	96.4	+ 5.0
1948	103	103.1	99.9	+ 3.6
1949	97	93.3	104.0	+ 4.1
1950	113	101.7	111.1	+ 6.8
1951	121	110.0	110.0	− 1.0
1952	125	111.6	112.0	+ 1.8
1953	136	117.1	116.1	+ 3.7
1954	127	106.5	119.2	+ 2.7
1955	140	113.2	123.7	+ 3.8
1956	144	114.8	125.4	+ 1.4
Average Annual Per Cent Change:*				
1929-56				+ 2.0
1929-41				+ 2.6
1942-46				− 1.6
1947-56				+ 3.2
1952-56				+ 2.7

* *Simple averages of percentage changes.*

SOURCES: [1] *Federal Reserve Board Index of Industrial Production for Manufactures.*

[2] *Index of total man-hours of labor. Computed by multiplying the total number of manufacturing employees (as reported in the* SURVEY OF CURRENT BUSINESS, *various issues) by the average weekly hours worked by production workers (as reported in the* FEDERAL RESERVE BULLETIN, *various issues) for each of the years involved. It is assumed that the average weekly hours worked would also apply to nonproduction workers.*

[3] *Data in column 1 divided by data in column 2, times 100.*

[4] *Derived from index numbers in column 3.*

TABLE 3

Output per Man-Hour of Labor, Automobile Manufacturing Industry 1947-56

(Index Numbers, 1947-49 = 100)

Year	Output of Autos, Trucks, and Parts[1]	Man-Hours[2]	Output per Man-Hour	
			Index[3]	Per Cent Change[4]
	(Col. 1)	(Col. 2)	(Col. 3)	(Col. 4)
1947	95	100.8	94.2	-----
1948	101	100.9	100.1	+ 6.3
1949	104	98.4	105.7	+ 5.6
1950	132	113.2	116.6	+10.3
1951	120	111.0	108.1	− 7.3
1952	102	100.1	101.9	− 5.7
1953	126	127.1	99.1	− 2.7
1954	109	104.8	104.0	+ 4.9
1955	153	127.4	120.1	+15.5
1956	125	106.1	117.8	− 1.9
Average Annual Per Cent Change:*				
1947-56				+ 2.8
1952-56				+ 2.0

* *Simple averages of percentage changes.*

SOURCES: [1] *Federal Reserve Board Index of Production for automobiles, trucks, and automotive parts.*

[2] *Index of total man-hours of labor. For method of estimation, see table 2, note 2.*

[3] *Data in column 1 divided by data in column 2, times 100.*

[4] *Derived from index numbers in column 3.*

productivity in this country is increasing *at an increasing rate*. This is clearly false, since all three tables show lower average annual increases after 1952 than before. In 1956, only small gains were made in the economy as a whole and in all manufacturing, 0.8 per cent and 1.4 per cent, respectively. In the automobile industry, often regarded as a paragon of high productivity and progress, output per man-hour fell by 1.9 per cent from its 1955 level.

COMMON MISCONCEPTIONS ABOUT PRODUCTIVITY

Attention may now be turned to certain misconceptions which appear to be commonly held. There are several reasons for the currency of such misconceptions. First, the complexity of productivity concepts makes full understanding of them difficult, even for businessmen accustomed to deal in ratios and trends. It is not surprising that the general public should hold rather vague notions on the subject. Second, many of the data on which productivity analyses are based are of debatable meaning or accuracy. Third, and perhaps most important from a practical point of view, groups with essentially conflicting interests have concerned themselves with productivity. Leaders of business and organized labor, aware of the public and governmental interest surrounding wage negotiations or announcements of price increases, have sought to utilize the same productivity statistics to justify opposite positions.

In this general atmosphere of confusion and conflict, the basically objective character of productivity, and of its measures and usefulness in public and private policy formulation, has tended to become obscured. If at least some of the smoke can be cleared, the way to better understanding of the subject can be indicated.

Productivity and Production

Productivity is sometimes confused with *production*, the term commonly used to designate *output*.[4] Production or output is, however, only the numerator in a productivity ratio. This point may appear so obvious as to call for little comment. Nevertheless, the mistake has been made, even by economists. For example, in a recent discussion of productivity in relation to market expansion in a house organ of a leading consulting organization, reference was made to an annual increase of 3.3 per cent in "productivity." Analysis of the sources of this rate of increase showed that two-thirds of it (2.2 per cent) was derived from "more output per worker," while one-third (1.1 per cent) came from "more workers." Clearly, the terms "productivity" and "production" were being confused in this analysis. The actual annual rate of increase in productivity in this instance, when properly defined, was 2.2 per cent.

As illustrated in Table 1, comparison of the year-to-year changes in output (gross private national product at constant prices) and productivity indicates that there is no necessary or close correspondence between the two. In fact, in six of the years covered by the analysis, changes in output and productivity were in opposite directions. Moreover, even when the two variables changed in the same direction, the relative changes in output were typically much greater than those in productivity. In 1951, for example, private GNP at constant prices increased by 5.4 per cent while private GNP per man-hour of labor increased by only 0.5 per cent.

Total Factor Productivity and Labor Productivity

The measures presented in Table 1, like most published productivity statistics, reflect changes in output relative to *labor input only* and not to total factor productivity.[5] It is customary, in fact, to use the term productivity as synonymous with *labor* productivity. Several of the reasons for the emphasis on labor productivity are:

- Much of the interest in productivity has arisen from wage disputes between industry and organized labor. In this context it is natural that attention would be directed to the relationship between output and hours worked, as a means of evaluating (or justifying) a given hourly wage raise demanded.
- And closely related to the first reason, one of the most important sources of productivity information is the Bureau of Labor Statistics of the U.S. Department of Labor. The Bureau's interest in productivity dates from the 1890's, and since 1941 an organized program of productivity research has been carried on. Here, again, it is natural that emphasis would be placed on labor input.
- As a direct result of the Bureau's program, most of the available information on productivity is in terms of labor productivity. Hence students of the subject have been unable to broaden the concept except in qualitative terms, that is, without statistical information.

Although the reasons for emphasis on labor productivity are understandable enough, there is danger of making it synonymous with total factor productivity. The inference can be drawn that labor is solely responsible for

[4] In common parlance, the terms "production" and "output" are used interchangeably. It is desirable to make a distinction between them, however. *Production* is any activity which creates economic values. *Output* designates the *results* of production, that is, the goods and services created in the production process, provided, again, that production is taken in the economist's sense as the creation of utilities or economic values.

[5] Total factor productivity is the measure of output divided by the input of all tangible factors of production. Even this is a limited concept of productivity, because it does not include the intangible but important part of the factors of management, of government, and of the institutional arrangements surrounding patents, good will, etc.

productivity gains, if any, and that the benefits of increased productivity should consequently accrue entirely to labor. Actually, a principal reason for the long-run upward trend in output per man-hour is known to be the *substitution* of capital equipment for labor. This is reflected in the increasing amount of capital investment per worker which characterizes almost all segments of our economy, especially manufacturing.

Since the long-run increase in output per man-hour is affected by the substitution of capital for labor as well as by increased over-all productivity, it obviously would be desirable to separate these two influences in any analysis of productivity trends. No generally acceptable technique for accomplishing this has yet been devised, but a recent study by John W. Kendrick for the National Bureau of Economic Research gives some clue as to the extent of substitution. Kendrick's data indicate that *total factor productivity* has increased by an average rate of 1.7 per cent per year since 1899 (instead of the mythical 3 per cent annual improvement factor), while *labor productivity* gained by 1.9 per cent annually and *capital productivity* (output relative to the value of tangible assets) increased at the rate of 1.1 per cent.[6] As a rough approximation of the relative importance of the two factors in over-all productivity, increases in the productivity of each may be attributed to the other. In other words, the 1.9 per cent annual gain in output per man-hour of labor can be attributed to increased use of capital equipment, while the 1.1 per cent annual gain in output per dollar of assets employed may be attributed to increased skills and efforts of labor. Using the ratio of 1.9 to 1.1, one might, for the sake of argument, say that 63.3 per cent of the gain in over-all productivity should be attributed to capital and 36.7 per cent to labor.

Needless to say, this method of proportionally attributing productivity gains to labor and capital, respectively, is extremely crude. No account is taken, for example, of changes in *managerial* factors, such as organization and layout, which may in fact in specific situations be more important than either labor or the amount of capital employed in causing productivity changes. Whatever the "proper" division of productivity changes, however, it is important to distinguish between labor productivity, the productivity of each of the other factors, and total factor productivity.

[6] Joint Economic Committee, *Productivity, Prices, and Incomes* (Washington: 1957), p. 27.

"Productive" and "Nonproductive" Labor

The measures of productivity shown in Tables 1, 2, and 3 differ significantly from data compiled and published by the Bureau of Labor Statistics and by other governmental agencies for the same periods. For example, estimates recently prepared for the Joint Economic Committee show an increase of 39.9 per cent in real output per man-hour for all manufacturing from 1947 through 1956.[7] This is substantially in excess of the 30.1 per cent increase in productivity indicated in Table 2. The discrepancy arises from the fact that the Joint Economic Committee data, like those of the Bureau of Labor Statistics, are based on so-called *production workers* only, while the data in Tables 1, 2, and 3 include hours worked by *all workers* in each case. The untenable distinction between "production workers" and "nonproduction workers" is another major misconception in the study of productivity.

According to the Bureau of Labor Statistics, "production workers" include

> "... all nonsupervisory workers (including working foremen) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, and shipping; also, workers engaged in maintenance, repair, janitorial, and watchman services, product development and auxiliary production for a plant's own use (e.g., powerplant), and record-keeping and other services immediately associated with these production operations."[8]

[7] *Productivity, Prices, and Incomes*, p. 148, table 54.

[8] "Nonproduction Workers in Factories, 1919-56," *Monthly Labor Review*, LXXX (April, 1957), p. 435.

In computing its productivity data, the Bureau relates output to the man-hours worked by these workers only. Excluded are "nonproduction workers," consisting of

> ". . . those engaged in executive, purchasing, finance, accounting, legal, personnel, cafeteria, medical, professional, and technical activities; sales, sales delivery, advertising, credit, collection, installation and servicing of the firm's own products; routine office functions, factory supervision, and force-account construction."[9]

This arbitrary division of workers may be criticized on several grounds. Apparently the basis of the classification is the participation of the worker in *physical changes* of products such as fabrication, assembly, or processing. Even on this basis the breakdown is an arbitrary one; for example, why should a janitor be classed as a production employee, but not a factory supervisor? Or, if it is argued that the purpose of the classification is to separate supervisory employees from nonsupervisory workers, why are many of the latter group classed (for example, routine office workers) as nonproduction workers?

Furthermore, there are even more basic criticisms of the division between "production" and "nonproduction." The ultimate basis of the division seems to rest on the antiquated and completely untenable concept that only *physical* production or form utility creation is true production. If such a division were applied to the economy as a whole, the vast majority of all workers would be regarded as "nonproduction" workers. As of mid-1956, only 43.2 per cent of the employed labor force of the United States was engaged in activities connected with physical production (manufacturing, agriculture, mining, and construction). The remaining 56.8 per cent (employed in transportation, public utilities, wholesale and retail trade, finance, insurance, real estate, service industries, the professions, and government) would be classed as unproductive by this standard.[10] Furthermore, even within manufacturing, over 20 per cent of all workers are in the "nonproduction" group, and an undetermined number of employees in the extractive industries and construction should also be so counted. Hence, if the Bureau of Labor Statistics division were applied to all employed persons as of mid-1956, well over 60 per cent would be regarded as "nonproduction" workers.

Use of the term "nonproduction" implies that certain workers are productive and others unproductive. While it is not the intention of the Bureau to put such a stigma on all salesmen, executives, professional persons, and others not engaged in altering the physical form of goods, nevertheless its terminology perpetuates an idea long ago discarded by economists.

More important for purposes of productivity analysis, restriction of labor input data to so-called production workers creates a serious bias in much of the published information on the subject. As noted previously, there is a very substantial difference between the rate of productivity increase for manufacturing based on all workers and that based on production workers alone. The reason lies in the increasing proportion of manufacturing employees engaged in "nonproduction" jobs. Since 1947, this group has grown from 16.3 per cent of all manufacturing employment to 22.0 per cent in 1956.[11] The rate of growth among such workers has been *15 times as great* as that for production workers during the same period. The same tendency may be observed for the economy as a whole and for specific industries. In Table 4, indexes of output per man-hour based on all workers and on production workers only are compared for all manufacturing and for the automobile industry, respectively. In both cases, the rate of gain in productivity based on production workers alone is substantially higher than that based on all workers. In other words, if labor input is restricted to that of so-called production workers, productivity gains are grossly exaggerated.

[9] "Nonproduction Workers in Factories," p. 435.

[10] Theodore N. Beckman, "Value Added by Distribution," *Proceedings of the Twenty-Eighth Boston Conference on Distribution* (Boston: Retail Trade Board, Boston Chamber of Commerce, 1956).

[11] "Nonproduction Workers in Factories," p. 436.

TABLE 4

Output per Man-Hour of Labor, Production Workers and All Workers, All Manufacturing and Automobile Manufacturing Industry 1947-56

(Index Numbers, 1947-49 = 100)

Year	All Manufacturing		Automobile Manufacturing	
	Index Based on All Employees[1]	*Index Based on Production Workers Only*[2]	*Index Based on All Employees*[3]	*Index Based on Production Workers Only*[4]
1947	96.4	95.4	94.2	94.0
1948	99.9	99.8	100.1	100.6
1949	104.0	105.4	105.7	105.3
1950	111.1	111.8	116.6	114.3
1951	110.0	111.6	108.1	107.4
1952	112.0	115.3	101.9	97.7
1953	116.1	119.7	99.1	100.1
1954	119.2	125.6	104.0	107.7
1955	123.7	130.0	120.1	121.2
1956	125.4	133.5	117.8	122.7
Average Annual Per Cent Change:*				
1947-56	+3.0	+3.8	+2.8	+3.2

* *Simple average of year-to-year percentage changes in index numbers.*

SOURCES: [1] *From table 2, but starting with 1947 as the first year for comparison purposes.*

[2] PRODUCTIVITY, PRICES, AND INCOMES, *materials prepared for the Joint Economic Committee by the Committee Staff (Washington: 1957), p. 151, table 57.*

[3] *From table 3.*

[4] *Computed from output data in table 3 and from data published by the Bureau of Labor Statistics of the U.S. Department of Labor on the number of "production workers" and average-weekly hours worked by them in the automobile industry.*

The danger inherent in this is obvious. If, for example, a wage increase in 1956 were to be based on the index of output per production-worker man-hour, it would amount to 2.7 per cent, the increase indicated by the data in Column 2 of Table 4 for all manufacturing. Such a wage raise would, however, be inflationary, because output per man-hour actually gained by only 1.4 per cent (as shown by the data in Column 1 of Table 4). Furthermore, it can be argued that the productivity gain relative to production workers' man-hours may have been caused by a greater contribution on the part of nonproduction workers. More effective planning and supervision, for example, might easily account for greater output on the part of nonsupervisory factory workers, and this becomes accentuated with progressively increased automation.

Because of their inherent upward bias, productivity statistics based on production workers' labor input should be interpreted with great care. Better yet, this arbitrary and misleading classification of workers should be discontinued or should be used as only one part of the labor factor, and similar data should be developed for the total labor input.

The 30-Hour Week

A topic of much discussion and controversy has been the prospect of reducing the standard workweek from its present level of 40

hours to 30 hours.[12] Statements of some labor leaders indicate that reduction of the workweek will soon become a major bargaining issue.[13] In all of this discussion, productivity measurement is a vital factor, because the proposal of a 30-hour week is implicitly based on an assumption that productivity gains have been sufficient to permit such a reduction of labor input without significant deterioration in the volume of output. In other words, it is implied that workers now can (or soon will be able to) produce as much in 30 hours as they have been producing in 40. This assumption should be examined carefully in the light of the data summarized in Tables 1, 2, and 3.

A reduction in the workweek from 40 to 30 hours represents a 25 per cent decline in labor input per worker. If each worker is to produce the same output as he does at present, this reduction would require a corresponding 33⅓ per cent increase in output per man-hour. Assuming, for the moment, that the same proportion of the population is employed in the economy, how many years would it take to achieve a one-third gain in productivity? The average annual increase for the economy as a whole since 1947 has been 3.2 per cent. Since this is a compound rate of increase (like a compound interest rate), about 10 years would be required to achieve the needed over-all gain. For all manufacturing industries, in which the average annual rate of increase has been about 3.0 per cent since 1947, between 10 and 11 years would be required. Interestingly enough, in the automobile industry, where most of the talk about a 30-hour week has been going on, about 11 years would be needed to obtain a one-third increase in labor productivity (based on the average annual rate of increase of 2.8 per cent for 1947 through 1956, as shown in Table 3). All of these calculations assume that the average annual rate of gain for the postwar period can be maintained, which may or may not be true. As a matter of fact, except for 1955, the rate of productivity gain has declined since 1952. Hence, attainment of the 30-hour week may be receding even further into the future.

But this is still not the full story. All of the estimates in the preceding paragraph are based on an assumption that the ratio of persons employed to total population will remain constant. This factor is important because general living standards must be measured relative to total population rather than to the labor force alone. The output of those who work must also be used for the support of those who are not gainfully employed: children, housewives, the aged, the infirm, and so on. Recent population trends indicate that the proportion of total population in these categories will rise significantly in the future. Higher birth rates combined with longer life expectancy produce a greater segment of the population in the usually nonemployable group.

Now, suppose that the percentage of the population in the *employed* labor force declines from its present level of about 40 per cent to about 35 per cent. If, at the same time, the workweek were reduced to 30 hours, then in effect seven men would have to produce the same output in 30 hours each as eight men are currently producing in 40 hours each. Call this output, for the sake of simplicity, "100." Then the 100 units of output now being produced in 320 man-hours (8 men times 40) must be produced in 210 man-hours (7 men times 30). This implies a necessary increase in output per man-hour of 52 per cent instead of 33⅓ per cent as previously computed. How long would it take to achieve an increase of this magnitude, assuming that postwar average annual increases can be maintained and the more recent trend reversed? For the economy as a whole, at 3.2 per cent annually, it would take about 13 years. For manufacturing as a whole, at 3.0 per cent annually, it would require over 15 years. For the automobile man-

[12] This is presumed to consist of a 5-day week of 6 hours per day as used in the tire industry, although it sometimes takes the form of a 4-day week in some of the discussions of the subject.

[13] See, for example, "Next Big Labor Issue: Shorter Work Week," *Business Week* (April 20, 1957), pp. 41-42.

ufacturing industry, at 2.8 per cent annually, it would take between 15 and 16 years. In other words, soberly considered, the 30-hour week is not "just around the corner," but is a possibility by the early 1970's under the given assumptions.

One further point can be made in connection with the discussion of a 30-hour week. All of the preceding analysis assumes that the present standard of living—in terms of output *per capita*—is completely adequate and satisfactory to the American public. This assumption is historically invalid. Almost without exception, consumers in this country have preferred to take higher material living standards rather than shorter hours. In the postwar period, this has been demonstrated by one extremely important trend, namely, the increasing number of women employed in the labor force. Many of these women are married and have children. If they are satisfied with the standard of living supported by their husbands' labor, why do they work? Furthermore, it would be interesting to know how many men work on two jobs, partly because of the short hours of work in their major occupation, and partly on account of their desire to raise their standard of living. It is believed that this tendency would be accentuated by a substantial shortening of the workweek. Whether this is desirable socially while there are still some unemployed is a question.[14]

In short, it is believed that discussion of a standard 30-hour workweek is premature. It may be, as some believe, that labor leaders are using the issue as a means of obtaining publicity and of strengthening their support within the unions. Be that as it may, any concrete attempt to secure a 30-hour week solely on the basis of productivity gains should be carefully considered in terms of actual recent and probable future trends in productivity.

"Automatic" Productivity Increases

A final misconception about productivity, and perhaps most dangerous of all, is the mistaken belief that productivity gains occur consistently and automatically. In the house organ mentioned before, the statement was made that the productivity of the economy is increasing at the rate of "3.3 per cent *every year.*" Actually, the rate of increase cited is an *average* annual gain for a specified period. There is an important difference between such an average and the actual increase achieved in any one year.

As shown in Tables 1, 2, and 3, the increases in output per man-hour attained in 1956 were well below the annual averages of recent periods. In 5 of the 27 year-to-year changes in productivity shown in Table 1, *declines* rather than increases took place. For all manufacturing, no less than 8 of the 27 years saw decreases in productivity, while in one year (1943) no appreciable change either way occurred. In automobile manufacturing, almost half of the years covered in Table 3 (4 out of 9) involved declines and the average was heavily weighted by the unusual increases in 1950 and 1955, both of them years of very high production.

It is believed that if productivity trends were analyzed in detail on an industry-by-industry basis as in Table 3, far more variation would appear than is shown in Table 1. This is due to the fact that the data in Table 1 represent composite output and input trends for the entire private economy and are greatly affected by *shifts* in the relative importance of different industries. Thus, if labor and capital are shifted from a relatively unproductive

[14] Since this was written there appeared some published material on the subject, including a lead article on page 1 of *The Wall Street Journal* on September 13, 1957. In this article it was stated, on the basis of some surveys and other research, that growing numbers of rubber workers who have a short workweek in terms of a six-hour day hold down two jobs. Moreover, it was found that on the second job these "moonlighters" tend to invade other union men's fields where they are "usually willing to accept lower than prevailing or union wage rates." Again, a popular discussion of the many facets of the subject appeared in *Parade* on October 13, 1957 in an article entitled "Do You Really Want a Four-Day Week?" Here it was pointed out time and again that, among other things, many workers would probably take a second job if the week were so shortened, since they would prefer the extra income to more leisure time.

sector of the economy to a relatively productive one, an increase in over-all productivity would result. This could occur even if the productivity of each of the two economic sectors involved, considered separately, actually declined. The effect of such a shift can be illustrated by a simple example. Suppose that the entire economy consisted of only two industries, "Industry A" and "Industry B." Suppose, further, that the GNP per man-hour of the two industries in 1955 were as follows:

	GNP per Man-Hour	*Percentage of Total Economy*
Industry A	$1.250	70
Industry B	2.500	30
Weighted Average for Total Economy*	**$1.625**	**100**

**Computed by weighting output per man-hour in each industry by its relative importance. Thus, $1.250 times 70 per cent plus $2.500 times 30 per cent, divided by 100 per cent = $1.625.*

Now, in this situation, there would naturally be a flow of labor and capital resources from Industry A to Industry B, where, because of higher productivity, the rates of compensation would be higher. In the American economy, just such a flow has been taking place from agriculture to manufacturing.

To continue the example, suppose that in 1956 the shift of labor and capital to Industry B has increased its relative importance in the economy to 60 per cent instead of 30 per cent, while the relative importance of Industry A has declined from 70 per cent to 40 per cent. At the same time, assume a decline of 5 per cent in the output per man-hour of each industry. Then, for 1956, we have the following situation:

	GNP per Man-Hour	*Percentage of Total Economy*
Industry A	$1.1875	40
Industry B	2.3750	60
Weighted Average for Total Economy*	**$1.9000**	**100**

**Computed in the same way as shown above. $1.1875 times 40 per cent plus $2.3750 times 60 per cent, divided by 100 per cent = $1.9000.*

The productivity of the economy as a whole has increased from $1.625 to $1.900, or by 17 per cent, though productivity in each of the component industries has declined by 5 per cent. This further points up the danger, previously stressed, of confusing productivity trends for the economy as a whole with those of individual industries or firms.

Actually, this simple example exaggerates the importance of interindustry shifts on productivity trends for the entire economy. According to estimates by the Joint Economic Committee based on data prepared by John W. Kendrick, only about one-eighth of the long-run increase in output per man-hour can be attributed to shifts among industries.[15]

IT IS hoped that this analysis will contribute to a clarification of the meaning of this important concept and to its wider use in business management. Productivity concepts and measures, intelligently applied, are valuable tools for the analysis of many business problems only insofar as they are sound and meaningful. It is further hoped that the article will throw more light and less heat on an admittedly controversial subject by a more realistic appraisal of accomplishments in productivity.

[15] *Productivity, Prices, and Incomes*, p. 19.

In what areas is the computer now being used? What are possible future applications of this important tool? Are we taking *full* advantage of the computer in stepping up our productivity?

The WIDENING *Potential of the Computer*

E. W. Martin, Jr.

Although I agree with current opinion that the electronic computer is having an important impact on our society and will have an even more spectacular impact in the future, there appears to be a tendency among businessmen to emphasize the application of automation to the office, to the virtual exclusion of the other areas to which the computers have contributed.

By "other areas" I mean the use of computers for complex calculations for science, engineering, automatic control, and the science of management. And, interspersed within these areas is the extremely important contribution that the computer is making to our national defense.

Within these areas the electronic computer has already made itself practically indispensable, and it is being applied in areas once undreamed of. In this article we will explore the impact that the electronic computer is having today, always striving to distinguish between accomplishment, demonstration of feasibility, plans, and speculation. Certainly it behooves us as businessmen to be aware of the total impact of the computer. The overall influence of the computer upon our technological progress, standard of living, and national defense is growing so rapidly that management cannot afford to fall too far behind.

For example, the use of several large electronic data-processing machines installed in controller's departments has escaped mediocrity only by application of the machines in engineering for a few hours per week.

As far as the present is concerned, there is little doubt that the major success attained through the use of computers has been in these other areas. This is not meant to imply that the use of computers in the office has been a failure. The majority of applications have been mildly successful, and on

several occasions excellent results have been achieved. But most of the dreams of automatic offices and immense competitive advantages are still merely dreams. Many of these dreams will yet materialize, but there is much hard work between now and then, and we must learn a great deal about the problems of data-processing and about the computers themselves.

COMPUTERS AND OFFICE AUTOMATION

Before going into these other areas, however, let's take a look at the present status of office automation. In this area we are interested in the ability of the computer to process information rather than in its ability to do large amounts of arithmetic. Although so far there have been few spectacular successes in the use of computers for office automation, this field is still in its infancy—the first large computer to be used for office work was installed in mid-1954. The problems associated with integrating a computer into the data-processing system of an organization are much more complex than was originally expected. Over 80 organizations are devoting their energies to the solution of these problems as they install large-scale machines; steady if unspectacular progress is being made. Moreover, a healthy tendency to work toward an understanding of the problems of data-processing is developing—even though the use of a computer is not anticipated for the near future.

One of the major objectives of office automation is the reduction of clerical costs. Although attempts at cost reduction have often fallen far short of the goal, there have been some successes, mainly in situations involving extremely large volume. For example, the Ford Motor Company is using a large electronic computer to save several hundred thousand dollars a year in the cost of preparing their 100,000-man payroll in the Detroit area.

Among the largest "paper-work" industries is life insurance, where large amounts of information must be maintained on each policy in force. Franklin Life, John Hancock, Prudential, National Life, Metropolitan Life, and Pacific Mutual are among the life insurance companies that have installed large electronic computers for such functions as premium billing, commission accounting, dividend calculations, actuarial calculations, calculations of reserves, and so on. One of these companies—it is reported[1]—is replacing 113 people and punched-card equipment costing around $216,000 per year with a large-scale computer. Although they probably have over $2 million invested in the computer and the various costs of getting started, they should be saving several hundred thousand dollars per year above the cost of amortizing this initial investment.

However, the possible increase in the operative efficiency of an organization made possible by the use of "higher quality" information provides an even larger potential savings than that of increased clerical productivity. For optimal control of a complex industrial organization, management should have current information. If the Univac can be used to predict accurately the total electoral vote in an election on the basis of a few early returns,[2] why cannot similar computers and techniques be used to predict the "votes" of customers for our products?

Of course, it is much easier to talk abstractly about the need for "higher quality" information than it is to provide it, even if an electronic data-processing machine is available. Perhaps the most consistently valuable application of computers in the manufacturing industries has been in the area of material

[1] K. G. Van Auken, Jr., "The Introduction of an Electronic Computer in a Large Insurance Company," *Automation and Technological Change*, Hearings before the Subcommittee on Economic Stabilization of the Joint Committee on the Economic Report, 84th Cong., 1st sess. (Washington: 1955), pp. 290-300.

[2] On November 4, 1952, the Univac was used by CBS-TV to predict the outcome of the presidential election. At 8:30 P.M., on the basis of early returns from only 27 states (3.4 million votes out of an expected 60.0 million votes), the machine predicted the outcome within four electoral votes. See John Lear, "Can a Mechanical Brain Replace You?" *Colliers*, CXXXI (April 4, 1953), p. 59.

control. In a typical situation, the production schedule in terms of end items is broken down to obtain a schedule (taking into account lead time) of parts and materials required. By maintaining up-to-date inventory information available to the machine, it is possible to detect future shortages and even to write shop orders or vendor releases for the required parts and materials. The speed with which a computer can determine the effects of a schedule change can provide a monetary saving by permitting lower inventory levels; expediting and general confusion have often been spectacularly reduced. Many of the organizations that have the material-control situation well in hand are beginning to consider the use of the machines in production control, an area of vast and virtually untouched potential.

Incidentally, it seems to me inevitable that as these machines become used more widely, and as many of the clerical functions of the controller's department are mechanized, the finance function has an opportunity (or even a responsibility) to produce *all* of the internal information necessary for management to control the organization—rather than only the necessary *financial* information. The accountant of the future should be capable of determining what information is required and should be able to design the data-processing system to produce this information in the desired form at the proper time.

COMPUTERS IN SCIENCE

Computers were originally developed by scientists and engineers to aid in the solution of problems involving large amounts of computation. The classic scientific method consists of:

- observation of a situation under study,
- formation of a hypothesis to explain what was observed,
- further observation and experimentation to check the hypothesis,
- modification of the hypothesis,
- further observation and experimentation

—and so on ad infinitum.

The hypotheses frequently are mathematical statements expressing relationships between observable variables. These mathematical statements are used for prediction, and the predictions are compared with the results of experiments in order to evaluate the worth of the hypothesis. This process of using mathematical statements for prediction often involves a tremendous amount of calculation.

For example, let us consider astronomy. In astronomy you cannot experiment; you can only observe. The motions of the various planets, comets, and stars can be represented by mathematical equations. The validity of the equations can be determined only by calculating future positions of these bodies based upon these equations, and verifying (or failing to verify) these predictions on the basis of observations. Before the development of the electronic computer, many astronomers spent the major portion of their working years slaving away over hand calculators making these computations. Today they can concern themselves with the formulation of better equations, devising equipment for obtaining more precise observations, and developing more efficient methods for solution of the equations.

Similar types of problems occur in nuclear physics, and in chemistry in the area of molecular structure. In the study of our atmosphere and its weather, extremely complicated equations involving large numbers of variables arise; great strides have been made in the understanding of weather since the development of the electronic computer. As a matter of fact, the late John von Neumann predicted that within our lifetimes we may learn enough about weather to actually control our climate.[3]

[3] J. von Neumann, "Can We Survive Technology?" *Fortune*, LI (June, 1955), p. 108.

COMPUTERS IN ENGINEERING

One approach to the design of a product to meet certain specifications is for the engineer to "guess" a first design of the product (based on his past experience), build it, and test the result. If this design is not satisfactory (and the first try usually isn't), he can make some changes, build a new model, and test it. This process then continues until a satisfactory product is obtained. Such an approach is extremely costly in terms of both time and money, and in certain cases (aircraft, guided missiles, and atomic reactors) it is too slow and costly to be practical.

Thus engineers have developed sets of equations (mathematical models) that represent the performance of the product. For example, in the case of an electric motor, these equations would involve the shape of the stator, the length of the rotor and the number of poles on it, the number of turns in the winding, the type of iron used and the shape of the magnetic circuit, and similar design parameters. To design a motor with given power and speed characteristics, an engineer would choose a combination of these design parameters. Then, using the equations, he would calculate the power and speed output given by his design. As before, if these characteristics did not meet his requirements, he would vary some of the design parameters and repeat this process. In the case of an electric motor, the calculations involved for one set of parameters would take about two days of the engineer's time using a slide rule. On an electronic computer these calculations would require but a few seconds.

If an electronic computer were available, the engineer would probably take a slightly different approach. Rather than choosing a set of parameters for just one design and evaluating this design, the engineer would choose parameters for many designs and, finally, compute several hundred designs in one batch. Then he would be in a position to choose the best of these many designs to put into production. Thus, rather than merely obtaining a workable design, there is a good chance that the best possible design would be obtained.

Westinghouse has recently devised a method for designing transformers that eliminates the engineer completely.[4] In this scheme, the computer is given the performance figures that the design must meet, and the computer simulates the method that the engineer might use as follows: The electronic computer chooses a set of design parameters, goes through the calculations to evaluate that design, and compares it with the specifications. If it does not meet these specifications, the machine decides which parameters to change and how much to change them. Then it repeats the process over and over until it achieves a satisfactory design.

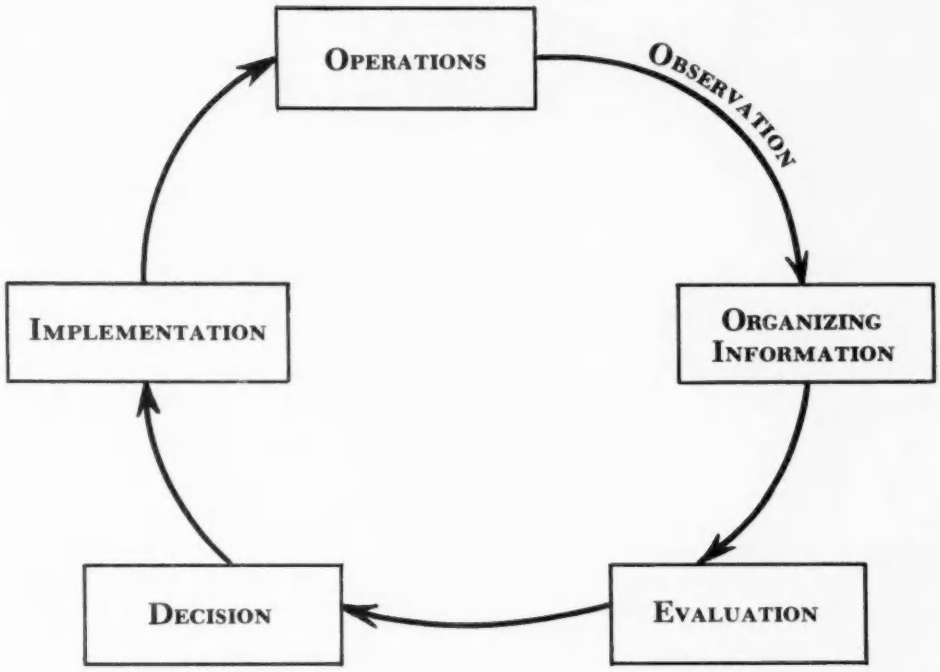
The aircraft industry provides numerous illustrations of the value of the electronic computer in design work. Indeed, it is safe to say that modern aircraft could not be designed without the aid of these machines. It is simply not possible to build a modern jet fighter or bomber and then see if it will fly. You must know before you build it not only whether or not it will fly, but how well, how high, how fast it will fly, and what fuel consumption it will require. Likewise, in the design of reactors you must know before you build it whether it will remain under control or explode.

COMPUTERS AND AUTOMATIC CONTROL

The basic concept of automatic control is that of the feedback loop in which the results of the operations under control are observed and compared with the standard or planned results. If the results deviate from plans, the proper controls must be changed by the correct amount in order to bring the operations back to standard. Today most such control loops involve one or more humans making the decisions, but in the future the computer may take over the control of entire factories

[4] Marshall Middleton, Jr., "Product Design by Digital Computers," *Westinghouse Engineer*, XVI (March, 1956), pp. 39-43.

Feedback Loop



in this manner, especially in the processing industries such as petroleum and chemicals.

Among the problems that must be solved in order to use a digital computer for control purposes is that of converting continuous physical quantities (such as voltage, length, rotation of a shaft, and so on) into discrete numbers that the machine can use. This "digitizing" problem has been solved, and there are several installations of computers in wind tunnels, where data from several hundred gauges (indicating temperature, wind velocities, pressures, and so on) are read directly into a computer, and this information is analyzed and converted to obtain the performance of the aircraft or engine under test. This information is presented to the test engineer while the test is in progress, so that he can control the future course of the test on the basis of these results.

The reverse of this problem occurs at the other end of the control loop, where we must convert numbers into physical quantities (voltage, motion of a shaft, and so on) that will control the operations involved. Examples of the solution of this phase of the problem are the several so-called "numerically controlled milling machines,"[5] which produce complex parts, without human intervention, from a series of numbers representing the mathematical equations of the surfaces involved.

Of course, the major difficulties in the control loop lie in the area of decision: After determining that the operations are deviating from the standard, what action must be taken in order to correct the observed deviations? The more complex the system being controlled, the more difficult this question becomes, and the more desirable a powerful computer appears.

By far the most ambitious automatic control system in existence today is the SAGE air defense system.[6] The heart of this system is an extremely large electronic computer into which is fed flight plan information, reports from the ground observer corps, and weather data. By means of a giant communication network, warning radar is tied directly into the

[5] "Making a Machine Run Itself," *Business Week* (March 9, 1957), pp. 183-87.

[6] H. T. Rowe, "The IBM Computer AN/FSQ-7 and the Electronic Air Defense System SAGE," *Computers and Automation*, V (September, 1956), p. 6.

computer. When an aircraft is detected, its position is screened against the stored flight plans to determine whether or not it is a potential enemy. If it is not accounted for as friendly, the machine presents its position, direction, and speed pictorially on a cathode-ray tube map in front of the sector commander. In addition, the computer suggests a distribution of available forces to meet all of the threats. However, the human commander decides on the allocation of forces (he may accept the computer's recommendations or may modify them in any way that he sees fit) and indicates this distribution to the computer. At this point the computer again takes over and guides the interceptors to their designated targets, even sending out signals to fire the rockets at the proper time.

This entire system is essentially an automatic control loop in which a human being has a veto power. However, it should be noted that the subprocess of guiding the interceptors to their targets involves a closed feedback loop, since deviations in the course of the interceptors must be detected and corrected, and the interceptor must react to evasive action by the enemy.

There has recently been considerable discussion in the press of the growing hazards of air travel due to our lack of air-traffic control. Our already inadequate system is faced with growing congestion and faster and faster airplanes. It seems inevitable that an electronic air-traffic control system similar to SAGE will be required long before such a system can be designed and installed.

The successful launching of the Russian "Sputnik" satellites provides an illustration of the importance of the electronic computer. In order to have a good chance of observing visually an object 21 inches in diameter travelling at 18,000 miles per hour at an altitude of over 200 miles, it is necessary to know where and when to look for it. Furthermore, much of the scientific information to be obtained from a satellite depends upon a precise knowledge of the path which the satellite follows. The only practical way to determine this orbit from the small number of accurate sightings available is through the use of the largest and fastest computers available. Fortunately, two computing centers had been set up to determine the path of our Project Vanguard satellite, so we have been able to observe and learn much from the Russian Sputniks, even though we were not given the code (if any) for the radio signals which were broadcast.

Likewise, it is apparent that our present planes are approaching the speed at which human reactions are too slow to control them —if we ever reach the moon, a computer will pilot the rocket and any humans will just be along for the ride.

COMPUTERS AND MANAGEMENT SCIENCE

During the past few years a great deal of effort has been applied in the area of "operations research" or "management science" in order to develop a more satisfactory understanding of some of the complex decision problems facing management. The simultaneous development of computers has interacted quite fortuitously with these efforts, for the mathematicians and scientists involved here developed some powerful quantitative techniques that often require computers for their application, while at the same time the computers have been used with some success in the process of the research itself. Although the purpose of this research is to understand and solve problems rather than to find uses for computers, some of the most significant applications of computers have been developed in organizations with active operations research programs.

Some of the mathematical models that have been developed involve tremendous amounts of computation to obtain a solution. In this respect the solution of these problems resembles the solution of scientific and engineering problems much more than it does clerical data-processing operations. One of the best known of these techniques is linear programming, which has been used to decide where

to locate new plants, how to ship a product from plants to warehouses, and which bid to accept in a complex situation. Linear programming has also been used in scheduling refinery production in order to obtain the most profitable mixture of output products; given the cost of the input materials, the characteristics of the refinery involved, and the prices to be obtained from the various output products.

At Appliance Park near Louisville the General Electric Company has developed a mathematical and logical model to represent the internal cost structure of its Home Laundry Department. By using the Univac, this model can be manipulated to forecast a complete operating budget based upon product mix, price, and marketing program. By examining several alternative combinations of these variables, management is able to reduce the area of uncertainty involved in making these extremely important and complicated decisions.

Along similar lines, the American Management Association[7] has developed a "war games" approach to the training of executives to become more efficient decision-makers. In this approach, teams of executives compete with each other in the operation of a hypothetical business by making such decisions as determining production levels, price, product research effort, and marketing expenditures for the coming quarter. On the basis of these decisions, a resulting balance sheet and income statement for each team is produced on an intermediate computer. Then the same decisions must be made again for the next quarter of operations, and the computer produces the results for these decisions. Thus in a few hours the men are able to gain experience equivalent to several years of actual operation of a business, and the results of the decisions are available while the decision itself is still fresh in the minds of the decision-makers.

[7] Franc M. Ricciardi, "Business War Games for Executives," *Management Review*, XLVI (May, 1957), p. 45.

SPECULATIONS CONCERNING THE FUTURE

During the past few years development work has been done by scientists toward the use of the electronic computer in quite revolutionary areas. Although these things are not practical at the present, there are strong indications that some or many of them will be realities within our lifetimes.

One of the most challenging of these problems is that of *language translation*. Although there are many practical problems that remain to be solved, the feasibility of the use of an electronic computer to translate from one language to another was demonstrated in January, 1954, when an IBM 701 was used to translate several paragraphs from Russian into English. Although this demonstration involved a vocabulary of only around 250 words, and employed only about 8 of the estimated 90 necessary grammatical rules, it did produce a sensible output that was in proper word order and that chose between the meaning of words on the basis of context. Incidentally, shortly after this, the Russians demonstrated on one of their large-scale computers the practicality of translating from English into Russian. Needless to say, language scientists are devoting a lot of work to the theoretical developments that will make automatic translation of languages feasible.

The problem of *retrieval of information from libraries* is also receiving extensive study. Who knows how much unnecessary research work is being done today because the worker is not familiar with the results that have been obtained by others? Searching a library is a difficult problem because of the many classifications under which a given article might be filed. Also, it is extremely difficult to specify exactly the required information. For example, if the question asked is too specific, the answer may not include all of the available information; if the question is too general, the large percentage of the references in your entire library may completely snow you under. However, as these problems are solved, it may be possible in the future

to devise machines that will automatically search through the large libraries of the world for the information pertinent to a given problem.

Recently, an extremely large-scale scientific computer has been programmed to play an amazingly good game of checkers.[8] To decide on its next move, the machine examines each possible move, evaluates it (looking five moves into the future) and, on the basis of a formula that has been developed, chooses the best of the possible moves. Is this of any practical importance? No. But it does raise an intriguing possibility. Suppose a computer plays 10,000 games of checkers against human opponents. On the basis of this large amount of experience, could it be programmed to change the rules under which it chooses its next move? In other words, *can a computer learn?* This of course depends upon the development of a theory of learning. If we reach understanding of how a human being learns it may be quite feasible to develop a machine that can learn. Conversely, as we develop theories concerning how a human learns, we may be able to test these theories by means of a computer, and observe whether or not the theory actually works. Thus, the machines, though they are not themselves in any way brains, *may lead us to a more satisfactory understanding of the human brain*, and consequently to the development of new machines or new techniques that more closely approach the capabilities of the human brain.

CONCLUSION

It should be obvious that computers do not by themselves solve problems—they only compute. If you know what your problem is, and if you can devise a method by which the problem can be solved by computation, then the electronic computer can be used as a very powerful tool to obtain a solution. But if you do not understand the problem, or if you cannot devise a method to solve it using arithmetic, then any electronic computer is just so much excess baggage. Remember that each achievement of a so-called "Giant Brain" is actually the product of some man or group of men who devised the method that was utilized.

Thus, we can see that the future impact of the electronic computer is restricted primarily by the limitations of our knowledge of ourselves and our environment. Surely if we can gain an understanding of problems of the complexity of language translation and of the processes of learning, then we can begin to gain an understanding of the difficult problems that face the executive. But none of these problems will solve itself—someone must solve each of them!

Most large manufacturing firms have found that money spent on product research and development pays off manyfold. Some leading executives are now beginning to realize that research on management problems can pay off in the same way. First we must have understanding, and then we can begin to utilize efficiently the capabilities of the electronic computer.

Assuming that we can learn to use it efficiently, what is the impact of the electronic computer? The major impact of the electronic computer is on productivity: productivity of the scientist, the engineer, the production worker, the office worker, and the manager.

The future course of our material progress depends to a considerable extent on the productivity of our scientists and engineers. Any increase in the amount of effective work that a creative scientist or engineer can accomplish in a lifetime causes a corresponding increase in the productivity of our production-line workers, for many production productivity increases are the result of the design of better products or of more efficient machinery for production.

During recent times, the productivity of the office worker, and consequently his standard of living, has lagged significantly behind that of the production worker. The advent of the electronic computer, however, should

[8] "Putting Ideas to Work—Research at IBM," advertising in *Computers and Automation*, VI (January, 1957), p. 39.

give the clerical worker the tools with which to compete effectively with the production worker who has had the benefit of increasingly powerful machinery over a period of years.

Among the most important productivity gains are those of management, for the productivity of management determines the efficiency with which a business organization operates. This efficiency is often measured in dollars of profit or in return on investment, but it may also result in a better quality product for the same price or in the same product at a reduced price. Thus the productivity of management has a profound influence upon the course of our economy. The operation of a modern business organization is extremely complex, and to my knowledge no one knows how efficiently we are presently operating as compared with the possible optimum. However, many authorities agree that over a period of time management productivity will be increased significantly through the use of computers to obtain more effective information for management control, and through the use of advanced mathematical techniques for decision-making.

We are presently engaged in a political struggle that will in all probability be decided on the basis of the productivity of capitalism as opposed to that of communism. Thus the development of the electronic computer may not only influence our future standard of living, but it may help determine the future political situation under which we will live, or (in the extreme case) whether or not our civilization as we know it can continue to exist. It is apparent that the electronic computer may be one of the most significant developments of our time.

ANY machine constructed for the purpose of making decisions, if it does not possess the power of learning, will be completely literal-minded. Woe to us if we let it decide our conduct, unless we have previously examined the laws of its action, and know fully that its conduct will be carried out on principles acceptable to us! On the other hand, the machine like the djinnee, which can learn and can make decisions on the basis of its learning, will in no way be obliged to make such decisions as we should have made, or will be acceptable to us. For the man who is not aware of this, to throw the problem of his responsibility on the machine, whether it can learn or not, is to cast his responsibility to the winds, and to find it coming back seated on the whirlwind.

—Norbert Wiener

THE HUMAN USE OF HUMAN BEINGS

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Does the *evidence* justify

the uneasy suspicion—

Has Business Borrowed *too much?*

HARRY C. SAUVAIN

IN THE past decade business corporations have borrowed huge sums of money and have increased their debt at a rapid rate in order to obtain the funds required to finance business expansion. According to data of the U.S. Department of Commerce, at the end of 1956 the net debt of all business corporations in the country amounted to $208.2 billion[1] as compared with only $93.5 billion at the end of 1946. In those ten years, total corporate debt increased 2.23 times. These data are shown in Table 1.

The growth of debt continued in 1957 in spite of higher interest rates and a general condition of tight money. The amount of corporate bonds and notes sold by public offering and by private placement in the first three quarters of 1957 has exceeded the corresponding figure for 1956. Bank loans to business in recent months have been at the highest level in history.

The corporate debt figures of the Department of Commerce include both long-term and short-term liabilities for all United States corporations. Slightly less than one-half of the total consists of long-term debt in the form of bond issues publicly distributed, securities privately placed with insurance companies and other institutional investors, and term loans from banks. The short-term debt comprises the items commonly listed as current liabilities, including bank loans due within one year, but also includes other notes and accounts payable, and federal income tax liabilities.

Long-term borrowings have been increasing at a somewhat greater rate than those at short-term, and the proportion of total debt represented by long-term obligations has risen from 44 per cent at the end of 1946 to about 47 per cent at the end of 1956. Long-term debt increased 2.36 times from 1946 to 1956 and short-term liabilities increased 2.12 times in the same period.

THUS THE QUESTION ARISES

It is normal for business enterprises to increase their use of borrowed money in a period of great economic growth and high-level prosperity, such as we have experienced in the postwar decade. But the acceleration in the rate of debt expansion in the last several years, which developed into an almost explosive demand for capital in 1957, has caused some observers to wonder whether business borrowing has gone too far. People familiar with our economic history know that every major depression in modern times has been preceded by a period of debt expansion and that the severity of business recessions has been increased by efforts of business managers to reduce debts that have become alarmingly large. Is this such a period of excessive accumulation of business debt?

It is very difficult, of course, to generalize accurately about financial policies for the entire business economy. The total business economy includes a wide variety of industries

[1] The data in this article are derived from Federal Trade Commission–Securities and Exchange Commission, *Quarterly Financial Report for Manufacturing Corporations* (Washington, 1953-57).

operating under highly diverse conditions, and it includes millions of individual firms with radically different policies for raising business capital. Nor is there adequate statistical information on the financial circumstances of all business firms.

There are, however, some very interesting data on the financial development of companies in a major segment of our private economy—that is, business corporations engaged in manufacturing. For several years the Federal Trade Commission (FTC) and the Securities and Exchange Commission (SEC) have cooperated in preparing quarterly estimates of the aggregate financial statements of all manufacturing corporations. The estimates are developed from a sample drawn from corporations engaged in 23 manufacturing industries and varying in amount of total assets from under $250,000 to $100 million and over. Aggregate data such as these tell nothing of the particular circumstances or policies of the individual firms whose figures are included in the aggregates, but they do show general trends or tendencies in the financial development of the large group of firms. They may throw some light on the general question whether business has borrowed too much.

The current period of debt expansion dates from 1954. From about the middle of 1953 to late summer of 1954 there was a modest recession in business that brought about a sharp reduction in the short-term debt of business corporations generally and slowed the growth of long-term debt. Since 1954 production, prices, and gross national product have moved steadily upward and the growth of corporate debt has accelerated. The quarterly financial data for manufacturing corporations provide a basis for examining the expansion of corporate debt in relation to the over-all financial development of this large group of companies.

USES AND SOURCES OF FUNDS

Manufacturing corporations have increased their debts because they have required more money to carry on a growing volume of business operations. Their sales have increased from a low point of $60.6 billion in the third quarter of 1954 to $78.4 billion in the second quarter of 1957, an increase of 29 per cent in a little less than three years.[2] The total assets of manufacturing corporations reached a cyclical low level of $169.4 billion at the end

[2] The sales figure for the second quarter of 1957 is based on a different figure than the sales figure for the third quarter of 1954, but the data have been adjusted to be comparable.

TABLE 1

Net Corporate Debt

End of Year	Total Debt		Long-term Debt		Short-term Debt	
	Amount (billions)	*Index*	*Amount (billions)*	*Index*	*Amount (billions)*	*Index*
1946	$ 93.5	100	$41.3	100	$ 52.2	100
1947	108.9	116	46.1	112	62.8	120
1948	117.8	126	52.5	127	65.3	125
1949	118.0	126	56.5	137	61.5	118
1950	142.1	152	60.1	146	81.9	157
1951	162.5	174	66.6	161	95.9	184
1952	171.0	183	73.3	177	97.7	187
1953	179.5	192	78.3	190	101.2	194
1954	177.3	190	82.6	200	94.8	182
1955	195.9	210	89.3	216	106.5	204
1956	208.2	223	97.3	236	110.9	212

SOURCE: *U.S. Department of Commerce*, SURVEY OF CURRENT BUSINESS, *XXXVII (May, 1957), p. 21.*

of the second quarter of 1954 and then rose steadily to $211.5 billion at the second quarter of 1957. Thus, these companies acquired $42.1 billion of additional assets, an increase of about 25 per cent, and in one manner or another raised that amount of additional funds. The uses of the $42.1 billion and the sources from which it was obtained are shown in Table 2.

Current Assets Grow

Although this was a period of great expansion in plant and equipment, almost half of the additional assets acquired were current assets. Total current assets increased $20.7 billion, or 22 per cent in the three years ended June 30, 1957. This fact illustrates an often neglected but very important principle of business finance, namely, that sales expansion requires an almost proportionate and concurrent increase in the amount of inventories, receivables, and other current assets. Somewhat less than half of the additional assets acquired in the same period have been of a fixed nature. The balance sheet value of property, plant and equipment (net after valuation reserves), rose $17.3 billion, or 27 per cent in the three-year period. Other noncurrent assets absorbed the small balance of the additional assets acquired.

Borrowing Less Important

Analysis of the sources of funds (Table 2) shows that, in spite of the marked expansion of corporate debt since the second quarter of 1954, only about three-eighths of the additional assets acquired by manufacturing corporations was financed by borrowing. The greater part, about five-eighths, was provided by the growth of stockholders' equity, or net worth. Clearly, the owners of manufacturing corporations have been supplying their own money to finance business expansion in larger amounts than they have been borrowing.

To say that even 38 per cent of total expansion has been financed with borrowed money may be exaggerating the importance of borrowing as that term is usually used. Much of the increase in total debt has taken the form of larger amounts of accounts and notes payable and of other current liabilities. These items do not represent borrowing in the formal sense of the negotiation of loans and the procuring of money from some outside lender. They are simply liabilities incurred in the regular operation of business, and they normally increase in amount in a period of expanding sales and profits.

The increase in total current liabilities provided 23.2 per cent of the additional funds employed in manufacturing corporations in the three-year period under review and the increase in noncurrent liabilities provided 15.1 per cent. Noncurrent liabilities, in the nomenclature of the SEC and the FTC, includes all liabilities due in more than one year, and thus corresponds at least approximately with the category of long-term debt in the corporate debt figures published by the Department of Commerce. The principal components are bond issues and term loans.

Although the proportion of total additional funds obtained by noncurrent borrowing has been relatively small, total noncurrent liabilities have increased about 32 per cent in the three years ended last June 30. Term loans from banks rose 37 per cent and other long-term debt increased 31 per cent.

Equity Funds Used

Perhaps the most notable feature of the financing of manufacturing industries since mid-1954 is not the extent of their borrowing but rather their use of equity funds. Approximately $26 billion has been added to stockholders' equity in this period, an increase of 23 per cent in three years. The greater part of this additional equity capital is of course a product of the policy of retaining a large portion of earnings. Surplus and surplus reserves increased over $15 billion, or 23 per cent. The increase in capital stock, capital surplus, and minority interests was a little more than $10 billion, which is also about a

TABLE 2

Uses and Sources of Funds*

All Manufacturing Corporations (In Millions of Dollars)

	End of Second Quarter, 1954	End of Second Quarter, 1957	Uses of Funds	Sources of Funds
ASSETS				
Total current assets	$ 94,563	$115,278	$20,715	–
Total property plant and equipment, net	64,212	81,482	17,270	–
Other noncurrent assets	10,639	14,694	4,055	–
Total assets	**$169,415**	**$211,454**	**$42,039**	–
LIABILITIES AND STOCKHOLDERS' EQUITY				
Current liabilities				
Bank loans payable within one year	4,966	7,485	–	$ 2,519
Other notes and accounts payable	12,649	16,056	–	3,407
Federal income and excess profits taxes accrued	8,654	9,191	–	537
Other current liabilities	10,553	13,863	–	3,310
Total current liabilities	36,822	46,595	–	9,773
Noncurrent liabilities				
Loans from banks due in more than one year	2,859	3,925	–	1,066
Other long-term debt	15,805	20,661	–	4,856
Other noncurrent liabilities	1,372	1,779	–	407
Total noncurrent liabilities	20,036	26,365	–	6,329
Total liabilities	**$ 56,858**	**$ 72,960**	–	**$16,102**
Stockholders' equity				
Capital stock, capital surplus, and minority interest	46,336	56,900	–	10,564
Earned surplus and surplus reserves	66,220	81,594	–	15,374
Total stockholders' equity	**$112,556**	**$138,494**	–	**$25,938**
Total liabilities and stockholders' equity	**$169,415**	**$21 '54**	–	**$42,039**

**Data for the end of the second quarter of 1957 in this table are based on a somewhat different sample of manufacturing firms than the data for the end of the second quarter of 1954. The SEC-FTC have extended the data from the new sample back through a period covered by the old sample to provide an overlap. The overlap shows that the data from the new sample are slightly larger in size than those from the old sample. In order to obtain comparability, the 1957 data have been reduced by the percentage that the data from the new sample would have had to be reduced in the overlap period to make them the same as the old sample.*

SOURCE: *Federal Trade Commission–Securities and Exchange Commission,* QUARTERLY FINANCIAL REPORT FOR MANUFACTURING CORPORATIONS *(Washington: 2d Quarter, 1954, 2d Quarter, 1957).*

23 per cent growth in three years. It is evident that a very considerable amount of new stock has been sold in order to increase the capital stock account by such an amount, but some of the growth in this item has been a result of stock dividends which transfer funds from surplus to capital stock.

SIZE OF DEBT BY CONVENTIONAL CRITERIA

The fact that equity capital has been built up along with the expansion of debt is reassuring, but there remains the question whether corporate debt has expanded excessively in relation to the ability of the corporate debtors to meet their obligations. To examine this question directly we must consider some criteria of ability to pay debts.

Equity Capital "Cushion"

One of the most time-honored rules of moneylenders and trade creditors is that borrowers must have a satisfactory amount of equity capital in relation to their debts. The equity capital is considered to be a "cushion," or margin of protection for lenders, against the hazards of business enterprise. The aggregate financial statement for manufacturing corporations at the end of June, 1957, shows total liabilities, both current and noncurrent, equal to 52.7 per cent of equity capital. This relationship could be expressed the other way around by saying that the amount of equity capital was almost twice as great as the amount of total liabilities. The debt–equity capital ratio is shown in Table 3.

What is an appropriate or "safe" amount of debt in relation to equity capital is of course a matter of judgment. In making such judgments both business managers and economists rely largely on the record of the past. The record shows that the amount of total debt in relation to equity capital for manufacturing corporations fluctuates with the business cycle. At the end of the third quarter of 1953, which was the peak of the 1949-53 cycle, the ratio of total debt to equity capital was 57.9 per cent. This ratio declined sharply in the recessionary movement of 1953-54 and at the end of the second quarter of 1954 was down to 50.5 per cent. Since the latter date the trend has been upward but the June 30, 1957, ratio was still below the level of the 1953 cyclical peak. These comparisons seem to indicate that there has been nothing unusual about the accumulation of debt by manufacturing corporations in the past several years. The debt–equity capital ratio in 1953 did not prove excessive; therefore the ratio for the more recent period is not excessive.

Two-to-One Standard

Since the current liability section of the aggregate balance sheet has experienced greater growth and has contributed more to financing the expansion of assets than the long-term debt section, the question of excessive debt accumulation is particularly pertinent to this category of liabilities. There is an old and highly overgeneralized rule of thumb that current assets should amount to at least twice as much as current liabilities. By this rule the current liabilities of manufacturing corporations in the aggregate have been consistently within bounds, with the current ratio running regularly above the two-to-one standard since 1953.

Pattern of Variation

More important, however, to a judgment of the reasonableness of short-term debt is the variation of the current ratio with the business cycle. The normal pattern of the ratio is one of *decline* in the expansion phase of the cycle when total current liabilities rise proportionately more than total current assets, and then of *rise* in the recession phase as current assets are reduced and the proceeds are used to pay current liabilities. Table 3 shows that this pattern has prevailed in recent years. The current ratio was low at the peak of the cycle in 1953 when it stood at 2.32, it rose to 2.60 at the end of the second quarter of

TABLE 3

Ratios of Debt to Measures of Debt-paying Ability

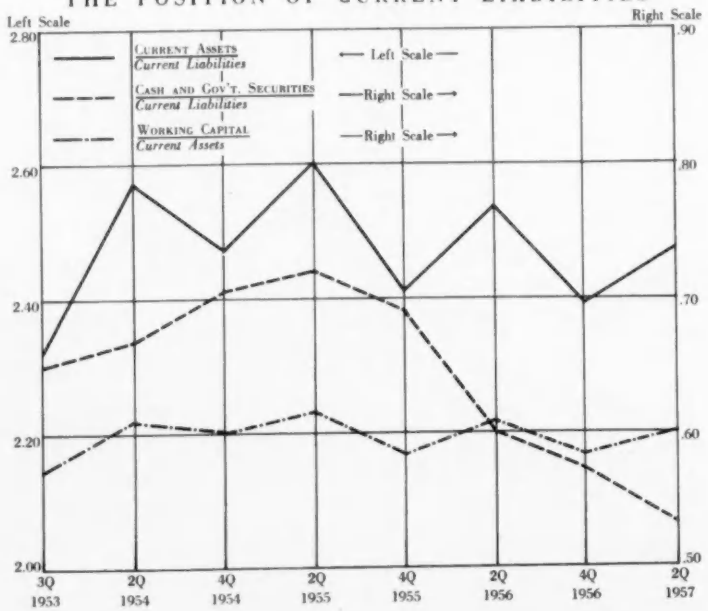
		3d Q 1953†	2d Q 1954	4th Q 1954	2d Q 1955	4th Q 1955	2d Q 1956	4th Q 1956	2d Q 1957
1	Total debt ÷ stockholders' equity	.58	.51	.52	.50	.54	.52	.55	.53
2	Current assets ÷ current liabilities	2.32	2.57	2.47	2.60	2.41	2.54	2.39	2.47
3	Working capital ÷ current assets	.57	.61	.60	.62	.58	.61	.58	.60
4	Total cash and government securities ÷ current liabilities	.65	.67	.60	.72	.69	.60	.57	.53
5	Net profit* ÷ noncurrent debt	.58	.58	.73	.76	.69	.65	.65	.60
6	Noncurrent debt ÷ total capitalization	.15	.15	.15	.15	.15	.16	.16	.16
7	Noncurrent debt ÷ net plant and equipment	.32	.31	.31	.32	.32	.33	.33	.32

*Net profit for each quarter (minus fixed charges and taxes) has been converted to an annual basis by multiplying by four.

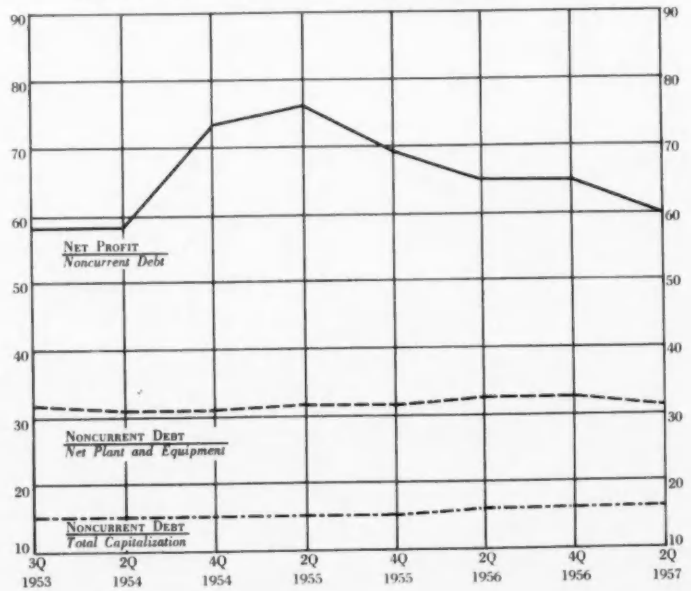
† The third quarter, 1953, data were selected for comparison with the current figures because that period represents a peak in the 1949-53 cycle.

SOURCE: *Derived from Federal Trade Commission–Securities and Exchange Commission,* QUARTERLY FINANCIAL REPORTS FOR MANUFACTURING CORPORATIONS *(Washington, D.C.: 1953-57).*

THE POSITION OF CURRENT LIABILITIES



THE POSITION OF NONCURRENT DEBT



1955, and with the further expansion of business it declined cyclically to 2.39 at the end of 1956. In the first half of 1957 this ratio improved to 2.47. Thus, the current position of manufacturing firms has been stronger during the current period of high-level business activity than it has been in past periods of good business.

The maintenance of the current ratio at a relatively high level reflects a policy of financing the expansion of current assets in considerable part from long-term funds. This kind of financing is indicated by the growth of working capital—that is, the excess of current assets over current liabilities—which necessarily comes from noncurrent liabilities and from equity capital. Between June 30, 1954, and the same date in 1957 the total amount of current assets increased $20.7 billion while working capital increased approximately $10.9 billion. Thus the amount of working capital on June 30, 1957, represented 60 per cent of current assets as compared with 57 per cent at the end of the third quarter of 1953.

The Quick Ratio

Financial analysts usually go beyond the current ratio to examine the quick ratio, that is, the amount of cash and highly marketable securities divided by total current liabilities. This ratio is said to be a measure of the ability of business firms to pay current debts from liquid or "quick" assets. Measured in this manner, the liquidity of manufacturing corporations has declined rather noticeably in the current phase of the business cycle. At the end of the second quarter of 1957 quick assets amounted to 53 per cent of total current liabilities as compared with 71 per cent at the end of the fourth quarter of 1954. It is an open question, however, whether this means anything more than that financial managers are making more efficient use of their quick assets under the stimulus of higher costs for borrowed money.

Long-Term Debt—Net Profit Relationship

Probably the best single measure of the ability of business enterprise to support long-term or noncurrent debt is the size of earnings relative to amounts required for payment of interest and other fixed charges. Unfortunately the FTC-SEC financial reports for manufacturing corporations do not show fixed charges separately, so no direct comparison can be made. However, the reports do permit comparison of the principal amount of long-term debt with net profit after fixed charges and all taxes. In this relationship net profits measure the margin left over after payments on debt; the larger the amount of net profit in relation to principal amount of long-term debt the greater is the ability of manufacturing firms to service their debt.

The figures in Table 3 (also illustrated in accompanying graphs) show that the amount of net profit relative to principal amount of long-term debt increased sharply from 58 per cent in 1953 and 1954 to 76 per cent at the end of the second quarter of 1955. Since that time the trend has been downward as the amount of debt has expanded and in the second quarter of 1957 net profits amounted only to 60 per cent of debt. This ratio, however, is still higher than it was in the 1953-54 period. The conclusion is clear that at current levels of earnings manufacturing corporations are well able to support their long-term debt.

The idea that the growth of noncurrent debt in recent years of good business has been moderate is further supported by the fact that since 1953 such debt has increased only from 15 to 16 per cent of total capitalization.[3] This can hardly be considered a trend toward top-heavy debt capitalizations.

Fixed Assets

Still another measure of the relative size of long-term debt is the amount of such debt in

[3] Total capitalization is defined as the sum of noncurrent liabilities and stockholders' equity.

relation to fixed assets, or plant and equipment. This measure seems to be based on the ill-founded assumption that long-term capital is used chiefly for the acquisition of fixed assets, or the equally dubious premise that in financial failure long-term creditors must look chiefly to fixed assets for satisfaction of their claims. Whatever its validity may be, the debt of manufacturing corporations has remained almost constant at about 32 per cent of net property, plant and equipment, in the period since 1953.

OR NOT BORROWED ENOUGH?

The financial data for manufacturing corporations certainly provide little basis for the idea that business has borrowed too much in the last few years of business expansion. The growth of corporate debt has in fact been more than matched by the growth of equity capital, and the ratio of debt to equity capital is lower than in the immediately preceding period of business boom. The growth in current liabilities has been exceeded by the growth in current assets, and current ratios in 1957 were at a relatively high level. Noncurrent debt has increased about in proportion to the expansion of equity capital on the one side and to the growth in plant and equipment on the other. However, the most impressive evidence of the ability of the manufacturing corporations to support their long-term debt is the comparatively large amount of net profit relative to principal amount of debt.

In fact, a case could be made from these data for the proposition that business has not borrowed enough. Within appropriate limits of financial safety, borrowed capital is the best kind of capital. It is cheap in terms of the rate of profit that a successful company can earn with it. Earnings on borrowed capital at rates of 10 to 15 per cent are quite common in the manufacturing industries. Even at the comparatively high interest rates currently prevailing, these rates of earnings provide attractive leverage for equity owners.

Borrowed capital is also cheap relative to the imputed cost of equity capital. The imputed cost is about the rate of earnings currently being realized on equity capital and, therefore, the rate that must be earned on additional equity capital to maintain the profitability of an enterprise. Many companies earn upward of 20 per cent on their equity capital after taxes. And borrowed capital is cheap in that interest on debt is deductible from income in figuring federal income tax.

An important advantage of equity capital from the point of view of business management is that creditors have no voice in management as long as they receive what is due them. Thus borrowing money does not dilute control and creates none of the problems, or potential problems, of raising capital by sale of stock.

The big deterrent to greater use of debt for financing business expansion is of course the fear that business managers have of business recession or depression. When profits shrink drastically, borrowed capital is not cheap and it may be very embarrassing. Most of the people who are today making decisions on financial policy remember what happened in the early 1930's.

Unfortunately we do not know the limits of financial prudence in the use of debt because we do not know the size of the next recession or how severely it will affect profits in any particular line of business. By historical standards the manufacturing industries in general have been using debt money conservatively to finance business expansion. If it is true that the business cycle has been flattened out in comparison with the cyclical swings of 25 to 50 years ago, perhaps they have been too conservative.

Consultation

To obtain informed views on the problem of whether or not the 1958 session of Congress should cut taxes, BUSINESS HORIZONS *assembled three of the nation's leading economists for a consultation in Washington, D.C., in late October, 1957.*

Known by their reputations to be of generally divergent views, these men were not unanimous in their answer to this question. They developed a rather wide area of agreement on the basic issues involved and on general criteria for tax policy in 1958, but there were important differences of detail reflecting their different value systems and the points from which they view the economy. The following is a summary of this consensus and of the differences in opinion where such emerged.

Messrs. Schmidt and Colm made it clear that the views which they presented are their own and not necessarily those of the organizations with which they are associated.

GERHARD COLM
Economist for the National Planning Association

ROBERT R. NATHAN
President of Robert R. Nathan Associates, Inc.

EMERSON SCHMIDT
Economist for the U.S. Chamber of Commerce

ROBERT C. TURNER, *Consultation Editor*
Professor of Business Economics and Public Policy
at Indiana University

WHETHER business activity goes up or down in the next few years, a tax cut may well be desirable and perhaps necessary. It is less certain, however, that a tax cut in 1958 will be warranted." This, rudely shorn of qualifications, exceptions, and precise definition of terms, is a summary of the views of economists Schmidt, Colm, and Nathan.

The qualifications, exceptions, and definitions, however, are the essence of the matter, and on these there was less than unanimity.

A tax cut would serve a variety of purposes:

¶ First, it would obviously be a welcome event to some 50 million individual and corporate taxpayers. It would certainly be a politically popular event. Indeed, there is a possibility that the two major political parties may vie with each other for the political credit for a tax cut that may or may not be justified on other grounds.

Should Taxes Be Cut by the 1958 Session of Congress?

¶ Second, as emphasized by all three of the participating economists, a tax cut would provide the opportunity for achieving some desirable and long overdue reforms in our tax structure. As a matter of practical politics, it is much easier to achieve shifts in tax burdens by lowering some taxes less than others than by increasing some taxes more than others. The occasion of a tax cut is an opportunity to achieve needed reforms. The three economists agreed on this principle, but it was apparent that there would have been considerably less agreement on what kind of tax reforms were needed or how they should be accomplished.

¶ Third, a tax cut may be used to stimulate business activity, either for contracyclical purposes or to sustain long-run economic growth. The three economists were agreed that tax policy is a major instrument for economic stabilization and that a tax cut would be clearly indicated if business activity declined substantially. But there were differences of opinion as to the extent of decline needed to trigger a tax cut, and as to the character of such a cut when and if made.

THE CURRENT OUTLOOK

THE economists emphasized the extraordinary degree of economic uncertainty existing at the present time—uncertainty arising chiefly out of potentially explosive developments in the Middle East, and out of our own reactions to these developments and to "Sputnik." They seemed to be agreed that, under the announced policies of the Eisenhower Administration, these events alone would not change substantially the short-term prospects for defense expenditures. (Colm estimated that, irrespective of policy changes attributable to "Sputnik," defense expenditures in fiscal 1958 may well run somewhat higher than the estimate [$38 billion] shown in the President's *Midyear Budget Review.*) But the three economists felt that these international developments did inject a major psychological element of nervousness and unpredictability into the general economic climate.

In spite of such uncertainty, economists Schmidt and Colm regretfully agreed with Nathan's prognosis that there is more likelihood of a downswing in the months ahead than of an upswing. "The probabilities appear to be in the direction of a softening, with no clear indication as to magnitude and timing," said Nathan. They all agreed, however, that a major depression, although it cannot be ruled out completely, does not seem to be in prospect.

Even accepting this guardedly pessimistic forecast, however, the answer to the question of proper monetary and fiscal policy was not automatically forthcoming. Indeed, two rather basic areas of partial disagreement quickly developed. One pertained generally to the relationship between prices and the level of employment and economic activity; the other to the objectives of stabilization policy and the relative importance which should be attached to restraining inflation and minimizing unemployment.

THE ANATOMY OF PRICES

THE first issue can be posed most clearly by stating it in extreme terms: Is it possible or likely that, in the contemporary U.S. economy, we could get a rise in the general price level while the levels of production and employment were going downhill? If the answer is a clear-cut "Yes," then we are indeed faced with a dilemma: Monetary and fiscal policy, as traditionally employed at least, would work at cross-purposes. Actions directed toward combating one of these unwanted economic tendencies would be just the opposite of those needed to combat the other tendency. We are "damned if we do and damned if we don't."

Colm

Evidence that this dilemma is a distinct possibility was presented by Colm. In the past year and a half, he said, the consumer price index has moved upward by five or six percentage points. This is not galloping inflation, but it is a significant rise in the price level which, if continued, could assume serious proportions. At the same time, industrial production has moved sidewise and the level of employment has declined slightly. It is true that GNP in current dollar figures has risen moderately, but much of the increase can be accounted for by higher prices, and the increase in *real* GNP has been considerably less than long-run growth would normally provide. He estimated that, except for the labor supply, we have some 20 per cent unutilized capacity in the country today. (There is some unutilized labor supply as well.) "A multitude of factors are at work in determining prices: costs, internal capital needs for expansion, and so on. This is not the classical play of the market. The rise in prices cannot be attributed to excess total demand. To term it 'cost-push' inflation is convenient shorthand but an inadequate

description of the process. It fails to recognize that, even though the initial impetus to price increases may occur on the cost side of the market, an increase in demand must follow along if those higher prices are to be sustained."

Nathan

Nathan agreed that a substantial decline in economic activity coupled with a continued upward movement in prices was a distinct possibility. He went one step further, saying that he felt that an upturn in employment and production (stimulated, for example, by an expansion of demand due to easing of credit policies) would not necessarily lead to any acceleration in the rate of rise in prices. This is especially unlikely, he said, in view of the fact that the price rise in the past year cannot be explained by excess consumer demand. Only excess investment outlays seem to have directly pushed up prices. "We don't really know," he said. "Prices are simply not performing according to the classical pattern. We need to know a lot more about the anatomy of contemporary price-making and inflation than we now know."

Schmidt

Schmidt agreed with the conclusion that the stimulus for cost increases seems to be coming from the cost side rather than the demand side of the market, and emphasized the fact that we have had a very tight labor market in recent years. "The unemployment figures show for the past ten years that whenever unemployment drops below 5 per cent [of the labor force] there tends to be price pressure; when it goes above 5 per cent the pressure seems to evaporate." Price pressure will persist, he continued, as long as labor unions are in a position to demand and get wage increases in excess of productivity increases—a situation he termed "wage inflation." (Nathan disagreed, saying that wages have not been the major factor in inflation.)

The only effective way to restrain this "wage inflation," Schmidt continued, is to restrain total demand to the point where the labor market is not drum-tight, cost increases (including not only wage costs but also costs of raw materials, rents, and so on) cannot be passed on in the form of higher prices, and labor unions are induced to moderate excessive demands. If the money supply is held in check, he said, total demand will not expand unless velocity rises as it has in the past year or two, and velocity obviously cannot go up indefinitely.

Nathan and Colm

Nathan and Colm agreed that an extreme restraint on demand could, of course, contain cost-induced price pressures. "But," said Nathan, "that restraint would have to be strong enough to result in four or five million unemployed before it would be a real price depressant."

This poses an issue which is of concern to all students of economic stabilization:

• Can inflationary tendencies originating on the cost side of the market be restrained by measures which restrict demand, without creating an intolerable amount of unemployment?

• And conversely, when business activity turns soft, will demand-oriented stabilization measures directed toward preventing a decline in employment serve to feed the fires of inflation?

None of the three economists present claimed to have a final answer to these questions. But their predilections were revealed in the way in which they evaluated Federal Reserve policy of the past few months when a tight money policy has been pursued in spite of a leveling off in production and employment.

Schmidt

Schmidt felt that Federal Reserve policy has been soundly conceived. The Federal Reserve, he felt, should not rush in to offset every minor fluctuation in business activity. "We should hold our major stabilization tools [monetary and fiscal policy] in reserve until the ball has clearly started to roll downhill in a dangerous way." As of now [late October], he said, the Federal Reserve should follow a neutral policy. The acute problem, he added, is the persistent upward creep in prices. Any relaxing of Federal Reserve pressure would only serve to accentuate this creeping inflation.

Nathan and Colm

Nathan and Colm, on the other hand, expressed doubts about the inflation-curbing effectiveness of the tight money policy. They felt that the Federal Reserve, focusing too intently on prices rather than on production and employment, have held to their tight money policy too long—that they should have eased credit policy, in a tentative and experimental way, several months ago.

Nathan

Would not this have encouraged labor unions to step up their demands for higher wages, and thus add to the cost-push type of inflation? Probably not, said Nathan. "Prices in the major industries where unions are strong, like automobiles and steel, are not sensitively responsive to changes in demand," he added, "and union demands are not likely to be significantly affected by small changes in total demand or in the level of unemployment. Further, administered pricing in these industries is not based on labor costs." In any event, he emphasized, we don't really know, and some experimenting with stabilization tools should be done. The social cost of failure to engage in such experimentation is a loss of production worth $10 or $15 billion. "The tight money policy of the Federal Reserve has not been too effective in restraining price advances," he added, "but it has contributed to the failure to achieve the economic growth of which we are potentially capable and it has brought about a costly and damaging interest-rate structure."

Colm

Colm agreed with most of this analysis, adding that the big advantage of using monetary policy for such experimentation is the fact that the controls are easily reversible. Changes in tax or expenditure programs, in contrast, are less easily reversible. "I would start by easing Federal Reserve credit controls now—or three months ago—and watch what the effects would be. By the time the Congress comes back into session, some of the effects would be known, and we could then make a more accurate assessment of the need for changes in tax policy."

STABILIZATION OBJECTIVES

THE objectives of stabilization policy are many. They include stability of the general price level, a high level of employment, and maximum growth in output of real goods and services consistent with prevailing relative preferences for consumption as against leisure. As has already been observed, however, these objectives sometimes conflict with each other, and measures taken to achieve one may interfere with achievement of another.

The three economists were agreed that public policy must seek the best possible compromise among these objectives. They were also agreed that the exact character of this compromise is not a matter which economists qua economists can decide. Rather, it is a proper subject of political decision, using the term "political" in its broadest and best sense.

Nevertheless, their observations on this problem and the relative priorities which they would give to competing objectives are valuable in pointing up the character of, and the issues involved in, the political decision to be made.

Nathan

Nathan would give a relatively high priority to economic growth and full employment. Price stability is important, he said, but in seeking price stability we should be careful that we do not throttle economic growth. If we are forced to sacrifice some price stability to gain our employment and growth objectives we should do so, he said, because the social cost of inflation is chiefly an inequitable distribution of a given real output, while the social cost of underutilization of our economic resources is "output gone down the drain, never to be recovered." "We should emphasize employment and output," he summarized, "while seeking aggressively to prevent inflation in an environment of relatively full employment."

"We need to develop new stabilization tools which will restrain inflation without creating unemployment," said Nathan. "Perhaps we should use accelerated amortization on new investment as a stabilization device, permitting accelerated amortization for tax purposes when business expenditures for new plant and equipment go below 6 per cent

of GNP, and taking it off when they go above 8 per cent. Or maybe we need some new instrumentality for getting a sharper public focus on price and wage changes. One possibility is to require a month's public notice of any increase in prices or wage rates. These may or may not be practical, but we need to realize that monetary policy is not going to do the job alone."

Colm

Colm concurred in the emphasis on employment and output, although he would put somewhat more emphasis on the importance of preventing inflation. "One of the most encouraging developments that I have observed in recent years," he said, "is the fact that the intellectual leadership of all economic groups is coming to realize that economic growth is the only real way to increase our standards of living—that increasing the 'size of the pie' is much more important than quarreling over the size of any one share of a given pie."

Schmidt

Schmidt concurred in the need for growth, but would give equal emphasis to price stability. He felt that if we neglect price stability we may, in the long run, actually impede growth. "An inflationary boom does not necessarily bring, but it certainly invites, the possibility of a bust. I certainly do not advocate unemployment, which is always tragic. But a moderate volume of unemployment, a few 'for rent' signs, may be the price we have to pay for sustainable economic growth and may actually reduce average unemployment over the long pull."

Clearly, these few sentences do not do justice to the positions and ideas of these three able and sophisticated men. Actually, the area of agreement among them on basic principles was considerable, but their differences or relative emphasis upon mutually desirable but sometimes conflicting objectives were significant. Pointing up these differences in emphasis illustrates the difficult public policy decisions which, through the total political process, the citizens of this country must make.

A 1958 TAX CUT?

THE three economists were agreed that, if business activity turns upward and vigorous economic growth is resumed, increasing revenues from our income-sensitive tax structure should make possible a cut in taxes, and indeed a cut would be desirable to assure continuation of economic growth. Schmidt was specific: "If prosperity continues and there is no further international crisis and if there is a sizable surplus of $4 or $5 billion in the [cash and consolidated] budget, I would divide that surplus about 50-50 between a tax cut and debt repayment."

Schmidt

Colm

Colm concluded, "Unless national security expenditures have to be stepped up considerably, it appears highly probable that substantial tax reduction will be possible and desirable during the next few years. If the economy resumes adequate growth, the tax base will expand so much over a period of years that tax reduction will be possible even if nondefense expenditures should continue their rise of recent years. Such tax reduction will then be necessary in order to assure continuation of economic expansion."

Nathan

Nathan generally concurred, subject to the view that before we cut taxes he would prefer stepping up expenditures for a number of highly essential domestic programs, including schools, slum clearance, resource development, conservation, and so on. Programs of this character are slow to respond to increased appropriations, he said, and should therefore be given a time priority over a tax cut.

In the event of continued softening of the economy, the economists were agreed that a tax cut would be desirable and appropriate, sooner or later, but they differed on the question of timing.

Nathan felt that although it is not clear at the moment, it is probable that we will need a tax cut for contracyclical purposes in 1958. What concerns him, he said, is that we have had a rate of increase in investment expenditures by business which, in his judgment, is not sustainable. Consumer demand has not risen in proportion to the increase in our capacity to produce. He would, therefore, move immediately with an easing of monetary policy, and with a tax cut in 1958 if, in spite of easier money, the economy continues to soften. Again, however, he would give a time priority to an increase in expenditures for essential domestic programs.

Colm

Colm would act similarly but perhaps somewhat more slowly. "If the economic growth should not be resumed shortly, or if a downturn develops, tax reduction will be needed to help turn the tide and promote the resumption of economic expansion. There is, however, a great difference in the timing for tax reduction depending on economic developments. In the present situation of economic uncertainty it is preferable to use first a relaxation of credit policy for promoting economic expansion because that policy can more easily be reversed if necessary.

"I believe it would be prudent to wait with tax reduction until the requirements of the national security program have been re-examined, and the economic outlook for 1958 becomes a bit clearer. If a situation emerges in which tax reduction appears warranted only if urgent increases either in national security programs or domestic economic development programs are delayed, I feel high priority should be

given to pursuing adequate programs rather than to an early tax reduction."

Schmidt

Schmidt would move even more cautiously. "Economic growth is not a continuous process; it is inevitably jerky. We should not try to offset every fluctuation in the economy—to demand perfection. If unemployment threatens to rise sharply, then obviously Federal Reserve policy should be loosened and taxes should be cut."

A tax cut in the present situation, and even more in a declining economy, he continued, would inevitably result in a deficit in the Federal budget. "A deficit does tend to stimulate business, but—over and beyond the obvious fact that it increases the Federal debt—it has an offsetting economic disadvantage: It increases the liquidity of consumers and of business, and hence sets the stage for a later inflationary spiral."

Colm

Colm concurred in this conclusion, but said that he felt that a moderate increase in liquidity could be prevented from subsequently having an inflationary effect by appropriate monetary policy. By "moderate" he meant a rise in liquidity far less than that which occurred in 1941-45. "No conceivable monetary policy could have contained the explosive inflationary potential inherent in that situation."

EDITORIAL FOOTNOTE

THE amount of disagreement which developed in this consultation was, of course, to be expected from three knowledgeable men of such varied interests and backgrounds. Actually, the area of agreement, on matters of principle at least, was substantial. They were in essential agreement in diagnosing the current economic outlook. There was less agreement in their analysis of the causes of the contemporary inflationary process. They were agreed that a tax cut, in due course, would be appropriate both to ensure continued economic growth and to counteract a decline in business activity.

Their differences of opinion, as this editor sees it, were of two sorts.

¶ First, there were matters of technical detail where, in our imperfect state of economic knowledge, reasonable and informed men will always differ.

¶ Second, however, there were differences which arise from the differing economic philosophies with which they started. What is really most important in economic life? Stability and orderliness? Change and progress? Equity? Individual freedom? Security? Efficiency? These and similar questions of basic philosophy will always affect the way in which anyone, economist or otherwise, approaches and analyzes an economic problem.

An effective sales forecast depends upon carefully classifying its components to better distinguish among them and to place them in proper perspective with an eye to the needs of the individual firm.

Fitting the Sales Forecast to Your Firm

JAMES B. BOULDEN

. . . the sales forecast is the foundation for planning all phases of the company's operations . . .[*]

ALTHOUGH the preparation of the sales forecast is difficult, the alternative to sales forecasting may be the economic failure of the firm. Unfortunately, no single source of information, technique, or type of forecasting can be suggested as most suitable for all firms. Businessmen must analyze their own products and market to determine what methodology of forecasting is most applicable to them. To make this choice intelligently, it is necessary that they be aware of the various alternatives which are available, and this will be the objective of the following discussion.

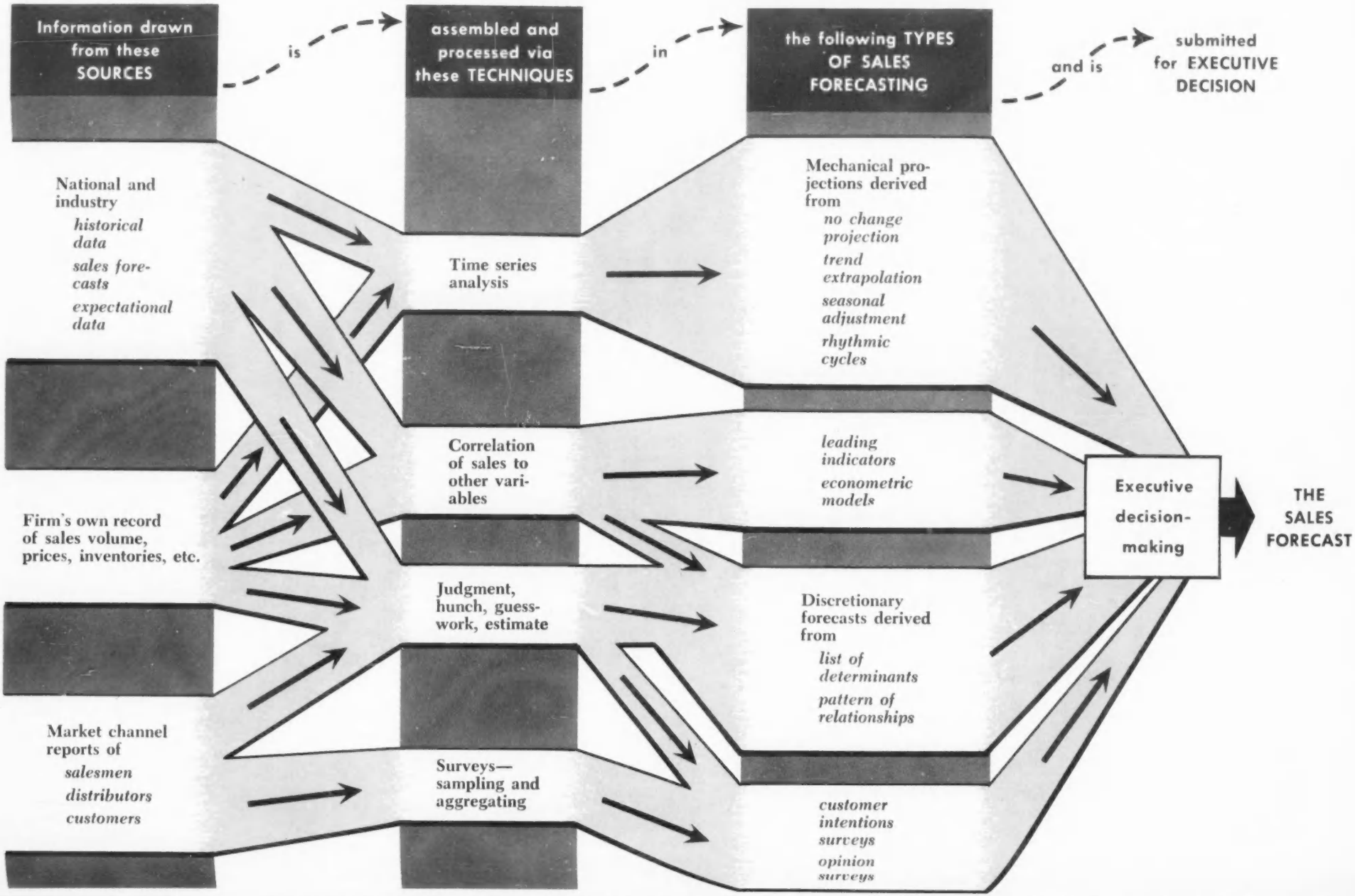
Figure 1 illustrates the process of sales forecasting: Briefly, information is drawn from the several sources and processed by one or more of the forecasting techniques. Each of these techniques may be used in several different ways depending on the type of forecasting being done. These types are not mutually exclusive but are often combined, so that one firm may draw from several information sources, utilize more than one technique and apply them in several ways. All sales forecasts end at the stage of executive decision where they are modified and adjusted. The remainder of this paper will be devoted to defining and clarifying this intricate process.

SOURCES OF INFORMATION

The business firm has three general sources of forecasting information: national and industry sources, the firm's own records, and its market channel. The national and industry information may be historical, as are the U. S. Department of Commerce National Income Statistics; or it may be expectational data, for example the Survey of Consumer Finances prepared for the Federal Reserve by the University of Michigan. Many firms also purchase national or industrial forecasts prepared

[*] Joel Dean, *Managerial Economics* (New York: Prentice-Hall, Inc., 1951), p. 142.

ELEMENTS OF SALES FORECASTING



by professional forecasters (although some large firms prepare their own national forecasts). These broad forecasts provide information from which the sales forecast of the firm may be prepared.

Almost every sales forecast makes some use of the historical records of the firm. Past sales volume, product prices, inventory levels, etc., are often important in predicting future sales. In addition, the firm may call on the salesmen, customers, or distributors of the firm for information useful in forecasting sales. The same firm may use all of these general sources as is illustrated by the following example of sales forecasting as performed by the New Departure Division of General Motors.

> Two independent forecasts are prepared by separate company groups to determine the future sales of ball bearings, the major product of this division.
>
> This first forecast is prepared by the sales engineers, who determine their customers' future requirements through direct interviews during regular service calls. These customer forecasts are then sent by the sales engineers to the home office where they are combined and summarized by individual product.
>
> The second forecast originates with an economic forecast using a national index as forecasted by available consulting services. The relationship of sales to the indicators is determined by using the historical data of the firm. The forecast is then prepared from the projected national index and the established sales-index relationship. It may be modified by executive decision according to anticipated changes in prices, competitive position, and other determinants.[1]

The information is not useful until it is assembled and processed by one or more of the available techniques applied in the proper type of sales forecasting.

TECHNIQUES OF SALES FORECASTING

Prior to a discussion of the various types of sales forecasts, it may be helpful to identify and classify the techniques available to the forecaster for use in gathering and analyzing information.

By "technique" I mean the method of handling the forecasting information while preparing the forecast—that is, the manner of performance. The same technique can be applied in different ways according to the type of forecasting being done. For instance, the time-series analysis technique can be used to identify seasonal variations, cyclical fluctuations, and trends that may be projected through time. Each of these applications is a specific type of sales forecast, which may be used separately or in conjunction with the other types.

The four general techniques of sales forecasting are: time-series analysis, correlation analysis, judgment or guessing, and sampling. Time-series analysis consists of relating sales to time; it can be performed either graphically or mathematically. According to an American Management Association survey of forecasting practices in 1956, this is the most common forecasting technique used by business firms. It is also one of the simplest and most easily utilized. An example of the use of this technique of forecasting is provided by the production-planning department of the Eli Lilly Company, which prepares a forecast for individual items by projecting historical sales data for the previous four years into the future using a 12-months moving-total sales figure. This trend is then reviewed by market research, where influences affecting the trend are considered.[2]

Sales of the firm may also be forecasted by correlating their movement to that of other variables in the firm, the industry, or the economy. For example, many firms have

[1] Robert E. Randel [General Supervisor of Finish Operations, New Departure Division, General Motors Corporation], "Variations in Forecasting Techniques at New Departure," in *Sales Forecasting, Uses, Techniques and Trends* (Special Report No. 16; New York: American Management Association, Inc., 1956), pp. 132-38.

[2] *Practical Techniques of Forecasting, Planning, and Control* (Manufacturing Series No. 216; New York: American Management Association, Inc., 1954), I.

found that their sales are closely related to the level of disposable personal income in the economy. This relationship may be so loose that only general shifts can be detected (lead series), or it may be so close that a mathematical relationship can be established (econometric models).

Another very common technique of forecasting used by businessmen places reliance on the use of judgment, informed estimates, hunches, and guesswork. This technique assumes that the analyst is capable of identifying the major determinants of sales and of weighting them according to their relative importance. The success of this technique depends largely upon the ability of the forecaster. It has the advantage of flexibility because it can be quickly adapted to changes in the economy—but it requires a very capable forecaster. Broadly speaking, all techniques of forecasting involve some judgment and/or guesswork, but some forecasters are able to produce excellent forecasts by relying on this technique alone.

In recent years, various types of sales forecasting that utilize sampling techniques have become popular. The basic proposition here is that effective sales forecasts can be prepared by directly or indirectly surveying the intentions of buyers. If this technique is to be valid, it must be ascertained that buyers plan in advance what and when they will buy and that they have the financial means to make the purchase. In addition, the forecaster must be able to conduct the survey effectively and interpret the results accurately.

There seems to be no one "best" technique of forecasting, although professional forecasters often have favorites. In each instance, the nature of the product and the market must be analyzed carefully to determine which technique (or combination of techniques) is the most suitable. Once this decision is made, the businessman has to determine how the technique will be used. The following classification of sales-forecasting types may assist him in making this decision.

MECHANICAL FORECASTING

Sales forecasts may be broadly classified as "mechanical" or "discretionary"; these classifications are not mutually exclusive. The mechanical forecasts are all based on the premise that past relationships or performance will continue into the future. James Meredith of the Standard Oil Company of New Jersey states:

> ". . . The basic premise in forecasting is that, by and large, the forces which operated in the past to produce certain results will continue to be associated with those results in the future . . . the real difficulty lies in timing."[3]

It is possible to prepare mechanical forecasts objectively because past performance or conditions are relatively fixed and measurable. Of course, the distinction between mechanical and discretionary forecasts is relative rather than absolute because *all* forecasts involve some discretion. For example, even in the use of the time-series technique in trend projection, it is necessary to use discretion in determining whether to apply the technique graphically or mathematically, and in deciding what to project. Finally, executive decision concerning acceptance or modification of the forecast is always involved. However, having made this qualification, it is still useful to distinguish between the forecasts that are predominantly mechanical and those that rely primarily on the use of discretion by the forecaster.

Mechanical forecasts utilize the techniques of time-series analysis and correlation analysis—in "no-change projection," "trend extrapolation," "seasonal adjustments," and "rhythmic cycles"—in "lead series" and "econometric models."

No-Change Projection

The simplest method of forecasting is projecting the current level of sales into the next

[3] James B. Meredith [Division Head, U.S. Division, General Economics Department, Standard Oil Company of New Jersey], "Short, Medium, and Long-Range Forecasting," *Sales Forecasting*, p. 88.

period on the assumption that volume will not change. Unfortunately, this is the elementary stage at which the majority of small- and medium-sized firms are stranded. One purpose of this article is to inform these firms of the excellent forecasting tools available so that they may be motivated to develop their own forecasting process. In fact, the firm that makes no forecast is actually anticipating that no change will occur in sales; this is certain to be an error for all but the most stable and mature firms.

Trend Extrapolation

This method projects the past trend of sales into the future. An example of this type of forecasting is the sales forecast of Pyrex cooking ware; the trend is extrapolated by the Corning Glass Company because the record of sales growth is fairly constant.[4] This basic theme can be expanded into a number of variations, such as projecting the percentage change in the previous period, the trend in percentage changes in sales, or the past trend in the level of sales. This technique may, in some instances, be the same as a no-change projection.

Seasonal Adjustments

One of the most widely accepted types of forecasting for less than one year is making a seasonal adjustment to "normal" sales. Many industries such as clothing, gasoline, and electric power experience seasonal variations. The basic reason for using this type of forecast is the certainty that physical changes will occur each year in the climatic environment with sufficient regularity to be predictable. Also, many business influences such as Christmas occur on specific calendar dates. This technique is often used to adjust seasonally a forecast made by other methods.

[4] Richard L. Patey, "Preparation of Coordination of Forecasting at Corning Glass Works," *Sales Forecasting*, pp. 111-20.

Rhythmic Cycles

Economists and businessmen have attempted (without much success) to isolate and identify uniform rhythmic cycles in sales of certain products, such as producers' durable equipment; and for certain types of activity, such as construction. An example of this type of forecasting is that of the Dodge Manufacturing Company, which produces equipment for the mechanical transmission of power.[5] The company forecasts, in part, by assuming that an upward movement in sales will last approximately 18 months and the downward movement around 12 months. Certain other firms have been able to identify regular replacement cycles such as the three-year automobile replacement cycles. Unfortunately, the cycles change frequently.

Lead Series

Recent improvements in lead-series techniques have brought increased recognition and use of this method of forecasting. This technique consists of selecting economic series in the economy that precede sales in changing direction. Once the sequence and the lead have been established, the forecaster can quickly forecast future changes in the direction of sales by observing the lead series.

Lead series are widely used, especially in the area of industrial goods. The demand for industrial products is derived from the sale of end products, and changes in sales may lag behind the demand for the end product. Many firms find it possible to identify events or variables that logically precede changes in product sales and that can be used to predict future turning points in sales. The early-moving economic indicators of the National Bureau of Economic Research provide a valuable tool for some firms.

[5] Donald E. Gates [Director, Marketing Research, Dodge Manufacturing Company], "Reliable Forecasting in the Smaller Company, Dodge Manufacturing Company," *Sales Forecasting*, pp. 121-31.

Econometric Models

The econometric model consists of a mathematical equation(s) expressing a historical, fixed relationship between sales and other variables. The model represents a "line of best fit" to historical data. The model technique may be used as a device for converting predictions of independent variables into a forecast of sales (the dependent variable), or a lead series may be used for the independent variable. In the former case, the forecaster is still forced to rely on other methods of forecasting to estimate the independent variables, and this may be as difficult as forecasting sales directly. The following method utilized by the Eli Lilly Company is an example of the use of a *simple* econometric model.[6]

> The first step of the forecast consists of an intensive study of the past records of the company sales and the size of the total market in which they occurred, for the purpose of determining the historical share of the market obtained by the company. The total industry volume is then forecasted from an estimate of disposable personal income which is purchased from an independent agency. This forecast is multiplied by the estimate of the company share of the market to obtain a forecast of company sales.

$$V = (I)^n(t) \qquad S = (V)(\%) \qquad S = (\%)(I)^n(t)$$

Sales volume of pharmaceutical industry $= V$
Disposable personal income $= I$ *Weighted* $= n$
Company share of the market $= \%$ *Time trend* $= t$
Total company sales for the forecasted period $= S$

A very similar approach is used by the Upjohn Company, which is also in the pharmaceutical industry. However, this latter firm prepares two alternative forecasts. In addition to the forecast obtained from a forecast of the industry as described above, another forecast is prepared from sales estimates submitted by branch sales managers for their respective sales areas. Executive judgment is then used to reconcile these two forecasts into a final sales forecast.[7]

DISCRETIONARY FORECASTING

Discretionary forecasting assumes that past relationships will not necessarily continue in the future. Thus, the forecaster must rely primarily on discretion in forecasting rather than on mechanical reference to past relationships.

One of the major advantages of discretionary forecasting is that both qualitative and quantitative factors can be considered, whereas pure mechanical forecasts are limited to quantifiable data. New methods of quantifying data are becoming available, particularly through the application of probability theory; however, many factors affecting the sales of a company still defy quantification—for example, the death of the company president or a major change in national politics. Because discretionary forecasts require the extensive use of judgment in interpreting information, highly trained forecasting personnel are usually necessary to produce satisfactory forecasts. This type of forecasting is well illustrated by the following discussion of sales forecasting by the Bell and Howell Company.[8]

> ". . . There is no substitute yet developed for executive judgment and this is the essential basis for our forecasts." Top executives hold monthly forecasting meetings to consider past forecasts and compare them with actual sales. Other factors are also considered, such as the current manufacturing schedule, the projected inventory position, competitors' activities, price changes, and special promotions. The treasurer also presents for consideration a long-range forecast covering general economic facts and summarizing the predictions of business analysts. The sales forecast is then prepared by executive judgment after consideration of these important variables.

[6] Kenneth F. Griffith [Director, Market Research Division], "Sales Forecasting at Eli Lilly," *Practical Techniques*, I, pp. 3-35.

[7] Alfred C. Scott [General Sales Staff Manager, the Upjohn Company], "Finding and Evaluating Basic Data for Sales Forecasting," *Practical Techniques*, I, pp. 41-51.

[8] Harold F. Driscoll [Director of Advertising and Market Research, Bell and Howell Company], "Sales Forecasting at Bell and Howell," *Practical Techniques*, II, pp. 38-39.

List of Determinants

This type of discretionary forecasting is accomplished by listing the important variables that affect the sales of the firm and by considering the nature and importance of each. This is essentially the method used by the Bell and Howell Company in the earlier discussion, where the forecast is the result of executive judgment after consideration of important factors affecting sales.

The businessman often performs this type of analysis when he informally notes his impressions of important factors mentally or on scratch paper in order to arrive at a considered conclusion about future sales. Since it is extremely difficult to select the pertinent variables and to weight them according to their relative importance, the success of the technique depends to a very great extent on the ability of the forecaster.

Pattern of Relationships

This technique has almost as many adaptations as there are forecasters who believe in the use of judgment and flexibility in making forecasts. It is exemplified on the national scale by forecasting through the use of the nation's economic budget. The basic approach is to forecast important elements separately and then combine them into some pattern in which their relationship can be re-evaluated with respect to each other until the system is internally consistent. An example is provided by the producer of a large variety of products who divides his total production into principal product lines and establishes patterns in the composition of sales within the line and between lines. A forecast of principal classes of products can then be cross-checked and expanded into specific forecasts of each individual product.

Customer-Intention Surveys

"The most direct method of estimating sales in the near future is to ask customers what they are planning to buy."[9] This type of forecasting is illustrated by the General Motors example given at the beginning of this paper. Here, the sales engineers directly interview customers during their regular service calls.

In evaluating the usefulness of intention surveys, it may be helpful to define two extremes of customer classification. At one extreme are the industrial buyers of large mechanical installations and production facilities, who plan far in advance of expenditure and who often follow through with their plans. At the other extreme is the consumer-goods field, in which planning and expenditures are practically instantaneous. The customer-intention survey is much more useful in the first instance than in the latter. An example of the use of customer-intention surveys is that of the Dodge Manufacturing Company.

> This company found that its sales are closely related to the producers durable equipment component of the gross national product. Therefore, the firm has found it useful to refer to the survey of intentions to invest in plant and equipment which is made quarterly by the Securities Exchange Commission and the Department of Commerce. The sales forecast is prepared, in part, by utilizing the established relationship of company sales to the forecasted producers durable equipment expenditures for the economy.[10]

The firm may determine customer intentions even more directly by personally contacting the specific customers of the firm. However, this often proves to be so expensive for firms serving large market areas, that it may be more practical to rely on surveys of consumers in general such as those performed by the Survey Research Center of the University of Michigan.

Opinion Surveys

The business firm may obtain some measure of future sales by surveying the opinions of

[9] Joel Dean, *Managerial Economics* (New York: Prentice-Hall, Inc., 1951), p. 167.

[10] Gates, "Reliable Forecasting in the Smaller Company," pp. 121-31.

persons likely to know what and how much customers will buy. Examples of opinion surveys include the annual survey of economists' opinions published by the F. W. Dodge Corporation and also the Survey of Bankers' Opinions published by the Credit Policy Commission of the American Bankers Association. These opinion surveys are an indirect means of determining how consumers will behave in a future period by asking a particularly qualified group what they *think* the consumers are intending to do in the forecasting period. This may be contrasted with the consumer-intention surveys that ask the consumers directly what they intend to do.

The firm may wish to supplement these national opinion surveys with private-opinion surveys through the regular distribution channels of the firm. This may be accomplished by polling wholesalers and retailers who are in close association with the ultimate consumer. Surveys or panels of experts may also be utilized by the firm in preparing the sales forecast.

THE FINAL COMBINATION

It would be very misleading if this discussion were to conclude without re-emphasizing the fact that many business firms draw their information from more than one source and apply more than one forecasting technique for assembling and analyzing the information in several types of forecasts. An improved forecast is often prepared by comparing several independent forecasts. This is illustrated by the following example of sales forecasting performed by a prominent midwestern bank.

> This bank draws information from national and industry sources, the firm's historical records, and from customers of the firm. Two independent forecasts are prepared, the first of which is formulated by the bank economist who forecasts the course of the national economy through the use of leading indicators. Using this information, he then prepares an "ideal" forecast for the various loan divisions and the deposit division with major consideration to maximizing the return on net worth in a manner consistent with approved banking practices and legal restrictions. The concept of what is "ideal" is extremely complex and involves consideration of the most effective distribution of bank funds as established by banking theory and law.
>
> The various loan division heads also independently forecast loans and deposits for their specific accounts. (The bank is organized around classifications of accounts.) These forecasts are prepared through projection of past trends and by personal discussion with major customers of the bank.
>
> The economist and the division heads then combine their judgment to reach an agreement on a reasonable forecast. This involves the use of judgment and detailed explanation on both sides to determine the proper integration of the two forecasts. The combined judgment is then presented to the comptroller, who prepares projections of the profit and loss statement and the balance sheet for future periods using past records to determine pertinent ratios. The forecast is prepared by months for the first quarter and by quarters for the year; it is revised each quarter. The final product is submitted to the president and the board of directors (they had also participated to some extent in formulating the forecasts) for executive decision and approval.

This illustration may be compared to a similar-sized bank also in the Midwest that relies on its loan division heads alone to prepare the forecast. The result is that the bank always surpasses the forecast because the responsible officers purposely, by their own admission, forecast low to make their "showing" better and relieve future pressure.

SALES forecasting then is a basic tool for anticipating the nature of future business operations. Future personnel requirements, purchasing commitments, production schedules, inventory plans, and financial budgets are based upon it. It is vital that businessmen be informed about the available alternative forecasting techniques, methods, and sources of information. The very success or failure of the firm depends upon selecting forecasting elements properly and fitting them to the needs of the business.

How to Quantify Decision-making

The intuitive approach to problem-solving is often inadequate for the complex situations of modern industry. Two well-known management consultants outline some advanced techniques for major business decisions.

Roger E. Ball and Allan A. Gilbert

One of the chief attributes of a successful business executive is his skill in planning and decision-making. In carrying out this function, the typical executive draws heavily on his experience with similar previous situations and relies on intuition, hunch, and that nebulous asset called business judgment. It is an unusual executive who habitually approaches business problems with a rigorous analytical technique, and, indeed, the executive who does so is seldom the most effective.

The intuitive approach is very often the most suitable approach, and frequently the only possible approach, to the majority of day-to-day business decisions. On a few occasions in every executive's career, however, a business problem arises that is so critical to the life of the enterprise and so complex that the executive instinctively wants something more concrete as a guide than his own intuition and experience.

The decisions made concerning these critical problems usually go to the very heart of business strategy and determine the long-range direction and accomplishments of the company. Almost always, they have two important characteristics:

¶ They involve questions of major policy and will affect the nature of operations for some time into the future.

¶ They involve the entire company and cut across the traditional areas of business management (such as production, marketing, finance, and personnel administration).

Typical examples of this class of business decisions are

- acquisition of, or merger with, another company
- introduction of a new product
- invasion of a new market

- construction of a new plant or relocation of existing facilities
- Major replacements of existing production equipment or processes with alternative or newer equipment or processes.

Since most executives are so infrequently faced with problems of this magnitude, they have little opportunity to develop skill and competency in analyzing and solving them by approaches other than those they use for problems of lesser consequence. Great reliance has always been placed upon intuition for the solution of business problems, on the assumption that the variables are so complex and the uncertainties so great that the executive's intuition is ultimately more reliable than a logical analysis.

In this situation, it is not surprising that executives tend to minimize the importance of thorough analysis and emphasize instead the importance of gaining acceptance of any feasible solution and of coordinating and controlling implementation of that solution.

It is certainly true that a second-rate course of action enthusiastically and vigorously pursued is preferable to a lackadaisical approach to a perfect course of action. This is not an excuse, however, for failing to use advanced analytical techniques where these can contribute to the determination of the best possible solution.

It is equally true, of course, that one can seldom rely on analytical techniques to the exclusion of intuition and sound business judgment; for seldom in the business situation are all the factors known or predictable. There are unquestionably still many types of problems (among them some of those listed earlier in this article) in which logical analysis cannot carry through all the way to the ultimate solution, and therefore the decision must finally be made intuitively. Furthermore, any business decision, no matter how reached, should ultimately be tested against the experience and common sense of the executive before implementation. Neither of these facts, however, negate the value of exhausting all the possibilities of logical analysis before resorting to intuition. Intuition functions best, in fact, when it is first cognizant of all the known facts.

Impact of New Techniques

The recent, rapid introduction of powerful new tools of business data analysis, notably operations research and high-speed electronic data processing, has often compounded rather than decreased the difficulty of making correct business decisions.

These new techniques literally flood today's executive with facts and figures bearing upon his problems, yet often these facts and figures are in a relatively undigested form. Furthermore, the operations researchers (and sometimes even the data-processing specialists) are prone to talk a language entirely alien to the businessman; and just as often, the businessman is unable to explain to the operations researchers and data-processors the real nature of his problem, because he is unable to use the mathematical language they depend upon so heavily. Management consultants have contributed significantly toward bridging this communication obstacle by interpreting the problems and conclusions of one group to the other; but this expert assistance has not been sought in every case and the problem is still large.

This mutual failure to communicate has led the executive even more to ignore this vast new source of information and to fall back upon the intuition that has guided him with apparent success through earlier similar problems. For this reason, unfortunately, some of the best work and most powerful tools of the operations researchers and data-processors are virtually inaccessible to the businessman when he most needs them.

THE LOGICAL APPROACH TO PROBLEM-SOLVING

There is a best way of carrying out a logical analysis of a business problem. It consists of four steps:

- Recognize, define, and list all available alternatives. (There must be at least two alternatives, else there is no problem.)

- Select a means of measuring each alternative in terms of desired results. (We call this the "decision criterion.")
- Forecast the results of each alternative in terms of the decision criterion.
- Construct a "decision rule," by which the most attractive results can be identified and thus the most desirable alternative selected.

In the remainder of this article, each of these steps is discussed in greater detail, with emphasis upon some of the common errors committed in practice. Finally, an example of an actual business problem analyzed by this approach is presented.

Recognizing, Defining, and Listing Alternatives

If the best possible business decision is to be made, it is axiomatic that all possible decisions must be considered. Failure to do so is probably the most frequent error in decision-making.

Other than entirely overlooking some possible course of action, some frequent errors in this phase of the decision process are:

- Becoming so attracted initially by one alternative, even though other possibilities are recognized, that this one alternative is investigated to the virtual exclusion of all others.
- Failing to recognize the inevitability of the future. (Is the choice really between taking the proposed step and not taking it, or is it more correctly the choice between acting now and acting some time in the future?)
- Overlooking, on the other hand, the alternative of taking no action at all.
- Disregarding the possibility of selecting a combination of alternatives rather than just one. (For example, to the alternative of purchasing a new machine and the alternative of rebuilding old equipment must be added the third alternative of doing both.)

Selecting a Decision Criterion

The correct selection of a decision criterion is of critical importance in the decision process. It is in this step that some of the most serious errors are made in the analysis of business problems. There are five particularly common pitfalls:

¶ The decision criterion must be a single measure, although it may incorporate more than one interrelated factor. The attempt to minimize or maximize several remotely related factors simultaneously quickly leads to frustration. The executive must decide at the outset what single criterion is of paramount importance, whether it be profits, manufacturing costs, stabilization of workload, or some other.

¶ The decision criterion must be measurable in numerical terms, or at least subject to numerical estimates. Although it may be very desirable, for example, to maximize service to the customer, it is usually not this in itself but, rather, the dollar cost of lost sales that is the real decision criterion.

¶ Each alternative must be measured against the same decision criterion. For example, if we find that one alternative leads to the lowest unit distribution cost, but another leads to the shortest delivery time to the customer, we have not really come much closer to a decision until we have somehow reduced these two conflicting arguments to some common denominator of measurement.

¶ From the above, it follows that the decision criterion must be such that it can be uniformly applied to all alternatives.

¶ Traditional accounting concepts must be accepted with a good deal of caution as decision criteria. They are often applied to situations for which they are entirely inappropriate. This is seen most frequently in connection with depreciation theory; too often, the accountant's depreciation charge is accepted as the true and complete cost of owning a machine, although this is seldom the actual case. There is also the tendency to accept too glibly the "fair rate of return" concept

and the "pay-off period" concept, although the best answer by these criteria is often not the best answer in terms of the principal over-all company objectives.

Forecasting Results of Each Alternative

The greatest problem in forecasting occurs when each alternative arises from business uncertainty. If there is only one possible future condition, the business decision is as a rule comparatively easy to make. In the great majority of cases, however, future conditions are not certain. And it is not the uncertainty itself, but rather the failure to recognize the existence of uncertainty, that most often leads to trouble in this area.

In other words, the executive is likely to say something like, "It looks as if our sales volume next year will be x. If this is the case, we should build a new plant." In saying this, he is often overlooking the distinct possibility that sales volume may in fact be significantly higher or lower than x, and each of these possibilities may dictate an entirely different decision. Methods of evaluating these possibilities will be discussed shortly.

There are also other errors common in forecasting results. First, there is far too little understanding of "lost opportunity" costs. How much, in terms of profits, would be lost to the business by not adopting a certain alternative? Furthermore, in the preoccupation with a problem in one department or function of the business, there is a general tendency to overlook effects of solutions to that problem upon other departments or functions, or upon the business as a whole. For example, in the attempt to minimize factory inventories, it is quite common to ignore the inevitable effects upon distributor or dealer inventories.

Constructing the Decision Rule—The Decision Matrix

The important consideration in selecting a decision rule is that it must be consistent with the major objectives of the company.

The most common decision rule is that of selecting the alternative that maximizes the total profits of the company. Closely related to this rule is the common rule of selecting the alternative that results in the lowest unit production (or distribution) cost. In selecting these rules, executives frequently reach decisions leading to results that they did not really intend. For example, a manufacturer might find that the best way to minimize unit production costs is to vary widely the size of his work force—yet this may be entirely inconsistent with the underlying philosophy of the company.

Once the alternatives have been listed, the decision criterion selected, each of the alternatives measured against this criterion, and a decision rule formulated, we are ready to move into the final phase of the decision process—selecting the most attractive alternative.

This phase can become exceedingly confusing, because at this point we have a great many facts to consider. Some means of arranging these facts in an orderly and meaningful manner is usually necessary. A useful device for this purpose is the decision matrix.

The decision matrix does not actually represent a new concept. It is rather a systematic and structured approach to the reasoning process that the executive must follow anyway, although he often fails to follow it completely. By the extent of that failure, he also fails to reach the best decision.

Rather than describing the decision matrix in a general way, we shall illustrate its use in an actual business decision situation.

Case Study of Decision Matrix in Use

The problem in this case study is a rather simple one involving a question of equipment replacement. Except for being substantially simplified for use here, this case is quite typical of problems presented to us by clients. The situation was this:

> A manufacturer intended to produce a new product and had to provide production facilities for it. The sales department estimated that it could sell 125,000 units a year of the new product. The

plant manager reported that he could just achieve that production rate (but no more) by rebuilding an obsolete turret lathe in the plant, and he requested an appropriation for that purpose.

In considering this appropriation request, the president wisely asked two questions:

1 Is rebuilding the turret lathe the only available alternative?

2 How confident is the sales department of its forecast of 125,000 units a year?

To the first question, the plant manager replied that the required production facilities could also be provided by buying a new automatic lathe; but this would have a capacity of 175,000 units a year, which was more than was needed, and which would involve a great deal more money. Hearing this, the president said, "Maybe we should also consider the possibility of doing both; that is, buying the new automatic lathe and also rebuilding the old turret lathe." The plant manager was sure that this combination possibility was out of the question, but he finally agreed that it should perhaps at least be "checked out."

With respect to the second question, the sales department reluctantly admitted that the sales forecast might not be infallible, but it assured the president that if there was an error, it was in the direction of being too conservative.

When the president pressed the sales department for a better picture of sales prospects, however, the department re-evaluated its data and came forth with the following table, which was the closest estimate possible.

The Probability Is	That Sales Will Be		
12%	*from*	0 *to*	50,000
23	*from*	50,000 *to*	100,000
30	*from*	100,000 *to*	150,000
23	*from*	150,000 *to*	200,000
12	*from*	200,000 *to*	250,000

The president then asked the controller to figure the marginal gross profit for each alternative at the following production rates per year: 25,000; 75,000; 125,000; 175,000; and 225,000. (Marginal gross profit is the difference between the total additional income derived from selling additional units and the additional out-of-pocket costs incurred in producing those units. Out-of-pocket costs include the capital cost of the investment in equipment, direct and indirect labor essential to the process, power costs, and scrap losses.) This marginal gross profit was the decision criterion in this case.

With all this information at hand, the president then constructed a decision matrix, which is illustrated in Table 1. In doing this, he went through the following steps.

1 Down the left side of the ruled paper he listed all the available alternatives—three in this case.

2 Across the top of the page, in the first row, he listed all the possible future conditions he wanted to consider, namely, production levels (which in this case were equivalent to sales levels since no inventories were carried) all the way from 0 to 250,000 units a year. In each interval, he used the mean production rate as representative of the interval (for example, in the interval of 100,000 to 150,000 units, he used the figure 125,000).

3 In the second row across the top, he entered the probability that each level of production requirements would be met.

4 Each "cell" in the body of the table now represented one alternative at one given production level. In each of these cells, he entered the expected marginal gross profit, as determined by the controller.

Examining the decision matrix at this stage, the president could see clearly that

—if sales were actually at the level of 125,000 units a year, the marginal gross profit would be the same if either of the first two alternatives were followed, and the first two alternatives would be slightly superior to the third.

—if sales rose to 175,000 units a year, no

TABLE 1

Marginal Gross Profit Decision Matrix

Production Rate Per Period	25,000 (0-50,000)	75,000 (50,000-100,000)	125,000 (100,000-150,000)	175,000 (150,000-200,000)	225,000 (200,000-250,000)	Expectation
Probability	.12	.23	.30	.23	.12	
Alternatives: Convert Turret Lathe	3,530	10,800	18,000	18,000*	18,000*	
Buy Automatic Lathe	3,370	10,800	18,000	25,000	25,000*	
Do Both	3,220	10,500	17,800	25,000	32,000	

* *If productive capacity were available, potential sales would support production rates at these levels. However, gross marginal profits are actually limited to the figures shown by the inadequate production capacity of the machine.*

additional marginal gross profit would be realized under the first alternative (since the turret lathe's output is limited to 125,000 units), but either the second or third alternative would add an equal and substantial amount to marginal gross profit.

- if sales should reach as high as 225,000 units a year, the greatest marginal gross profit would be realized only through the third alternative.
- and so on.

At this point, the president had to use some decision rule. He decided that he wished to identify and select that alternative that would give him the greatest over-all chance of realizing the highest marginal gross profit, considering the relative probability of each of the possible future conditions. In other words, rather than "hanging his hat" on any one particular sales forecast, he wanted to weight his decision according to the probability of each possible sales level.

To do this, he took the one additional step demonstrated in Table 2. Table 2 is identical to Table 1, except that the marginal gross profit in each cell has been multiplied by the probability figure above that column and these products have been added for each alternative across the page to arrive at the figure in the "Expectation" column.

The precise meaning of the "Expectation" figure is too complex to discuss here. In a practical sense, however, the alternative with the highest "Expectation" figure (the third alternative in this example) is the one that has the highest probability of yielding a maximum marginal gross profit. Thus, the president found that his best course of action, under the conditions he had laid down, was to both rebuild the old turret lathe and to purchase the new automatic lathe.

THE DECISION-MAKING approach described in this article is fundamental to all types of major business decisions that involve numerical data. The decision matrix illustrated can be applied, with some modification, to a great variety of such decisions. These procedures[1] together provide a rigorous, logical, quantitative approach to the analysis of business data for the solution of business problems. In many instances, this approach can be applied by company personnel. In more complex business situations, however, management may

[1] They are equally applicable, by the way, to a great many problems outside the business world, particularly in the analysis of scientific problems.

TABLE 2

Expectation of Marginal Gross Profit Decision Matrix

Production Rate Per Period	25,000 (0-50,000)	75,000 (50,000-100,000)	125,000 (100,000-150,000)	175,000 (150,000-200,000)	225,000 (200,000-250,000)	Expectation
Probability	.12	.23	.30	.23	.12	
Alternatives: Convert Turret Lathe	420	2,480	5,400	4,140	2,160	14,600
Buy Automatic Lathe	400	2,480	5,400	5,750	3,000	17,030
Do Both	390	2,420	5,340	5,750	3,840	17,740

require the expert advice of qualified management consultants.

Logical analysis and the decision matrix offer a number of advantages over the intuitive approach to business decisions. Chief among these are:

- They insist upon a logical, orderly, and consistent approach.
- They require listing of all possible alternative courses of action.
- They force equal consideration of each alternative under each recognized possible future condition.
- They require the use of a common numerical measure in evaluating each alternative.
- They are a natural complement to the recently introduced, advanced methods of data analysis.

Properly used, these techniques can help the business executive avoid the most common errors in the formulation of major business decisions.

A MAN may say, if he likes, that the moon is made of green cheese: that is an hypothesis. But another man, who has devoted a great deal of time and attention to the subject, and availed himself of the most powerful telescopes and the results of the observations of others, declares that in his opinion it is probably composed of materials very similar to those of which our own earth is made up: and that is also only an hypothesis. But I need not tell you that there is an enormous difference in the value of the two hypotheses. That one which is based on sound scientific knowledge is sure to have a corresponding value; and that which is a mere hasty random guess is likely to have but little value. Every great step in our progress in discovering causes has been made in exactly the same way as that which I have detailed to you. . . . It is in these matters as in the commonest affairs of practical life: the guess of the fool will be folly, while the guess of the wise man will contain wisdom. In all cases, you see that the value of the result depends on the patience and faithfulness with which the investigator applies to his hypothesis every possible kind of verification. . . .

—Thomas Henry Huxley

How does franchised distribution in the auto industry compare with that in other industries? Can — or should — the auto manufacturers' "good faith" bill be matched by the others?

THE Furor OVER Dealer Franchises

CHARLES M. HEWITT

BEGINNING in 1955 and continuing through most of 1956, newspapers, business magazines, and trade journals carried reports of the Capitol Hill battles between automobile manufacturers and their franchised dealers.[1] During this same period many gasoline service station dealers and their trade associations waged political warfare against the major oil companies.[2] And at present appliance dealers are restive in the face of rising costs and declining margins.[3]

The so-called independent marketers in several industries have experienced the economic impact of what appears to be an increased emphasis on volume production. Manufacturers have been engaged in fierce competitive struggles to sell higher volumes. In many cases traditional channels of distribution have been bypassed or disrupted. Dealer trade association journals have expressed deep concern over adverse selling trends. The issues raised are numerous and complex, and each industry has some special problems of its own.

Appliance dealers, for example, have been particularly disturbed about low margins, about discount-house operations, and about the direct sales that appliance manufacturers

[1] See "GM Extends Dealer Pact to Five Years; O'Mahoney Asks Blueprint for Reform," *Automotive News* (December 12, 1955), XXX; and *Automobile Dealer Franchises*, Hearings on H. Res. 11360 and S. 3879, House Antitrust Subcommittee No. 5 of the Committee on the Judiciary, 84th Cong., 2d sess. (Washington, 1956).

[2] *Gasoline Price War in New Jersey*, Hearings before a Senate Subcommittee of the Select Committee on Small Business, 84th Cong., 1st and 2d sess. (Washington, 1956). *Distribution Practices in the Petroleum Industry*, Hearings pursuant to H. Res. 56, House Subcommittee No. 5 of the Select Committee on Small Business, 85th Cong., 1st sess. (Washington, 1957).

[3] Richard E. Snyder, *Some Special Comments on Manufacturer-Retailer Relations* (Chicago: National Appliance and Radio-TV Dealers Association, 1956); "Dealers Find a New Enemy," *Business Week* (January 28, 1956), p. 61.

have been making to builder accounts. Dealers allege these discount houses and builders frequently are able to buy below dealers' cost.

Gasoline service station dealers have directed their main attack against certain alleged discriminatory pricing practices of their suppliers. Oil jobbers are disturbed about suppliers' direct sales to commercial accounts.

Automobile dealers, however, have been the only dealer group able thus far to obtain legislation directed toward remedying some of their problems.[4] The automobile dealers concentrated their attack on the franchise agreements historically used in this industry.

Various franchise arrangements are functioning in all of the industries previously mentioned. Do other industries have franchise problems similar to those in the automobile industry? In order to answer this question, it is necessary to define some terms and to summarize generally some of the perplexing problems inherent in the franchise relationship.

FRANCHISED DISTRIBUTION DEFINED

A marketing text published in 1941 stated:

> "In the past forty years dealer franchises have spread from their inconspicuous use between a few manufacturers and a handful of specialized outlets to become the dominant type of contract in the distribution of such items as automobiles, farm implements, electrical appliances, tires, pianos, petroleum products, radio, television, and wallpaper. Under the franchise system a manufacturer grants to certain dealers the right to sell his product, generally in defined areas, in exchange for promises to promote and develop markets for the products."[5]

The items listed in the foregoing quotation must be taken as only a partial listing of the consumer goods sold through various franchise arrangements. In addition, many industrial goods and a variety of services are handled through franchised dealers.

To keep the discussion within practical bounds, we will define franchise agreements as the standardized written agreements used by many manufacturers (or suppliers) for the purpose of distributing their products through a limited number of *selected* dealers and distributors. The term "dealer" is used to refer to any nominally independent merchant buying goods for resale at wholesale or retail, or both, pursuant to the terms of one or more franchise agreements.

PROBLEMS OF THE FRANCHISE RELATIONSHIP

Perhaps the outstanding general feature of the franchise system is the fact that franchises are designed to create special economic opportunities for a limited number of marketers. This selectiveness carries with it certain advantages and disadvantages for both manufacturers and dealers.

The chief advantage is this: The manufacturers are able to obtain extensive marketing outlets with a minimum investment. Dealers take title to goods and generally assume a substantial part of the economic risks.

Manufacturers must weigh this and other advantages of using a franchised distribution system against certain problems which seem to be inherent in the system. For instance, manufacturers sell their goods through dealers classified by law as independent businessmen. Serious antitrust problems may arise if any manufacturer attempts to control his franchised dealers' businesses.[6] Yet the temptation to exercise some controls over dealers is always present.

Unfortunately, the extra volume that may mean prestige and profits for the manufacturer may have a disastrous effect on dealer

[4] This legislation is discussed below.

[5] H. E. Agnew and D. Houghton, *Marketing Policies* (New York: McGraw-Hill Book Company, Inc., 1941), p. 73. By permission of McGraw-Hill Book Company, Inc.

[6] Charles M. Hewitt, *Automobile Franchise Agreements* (Homewood, Illinois: Richard D. Irwin, Inc., 1956), p. 160. Discussions on standardization of franchises, one-year franchises, legal classification of dealers, and cancellation threats may also be found in this book.

margins. On the other hand, too many dealers may be content to sit with low volume and high margins while the manufacturer is losing prestige and profits in the national market. To the manufacturer such a situation can be catastrophic.

Since the manufacturer has in effect put all or most of his distributive eggs in a limited number of baskets, it is understandable that factory representatives expect and demand results from dealers. It is also understandable that dealer resistance to this factory pressure can become a contributing factor in the development of "unauthorized" marketing channels.

From the dealer's viewpoint the franchise system makes many special aids available. In franchise relationships, however, the distinction between factory "assistance" and factory "domination" is sometimes difficult to define exactly.

A study of court cases involving litigation between manufacturers and dealers indicates that many dealer problems arise out of certain provisions usually found in franchises. Unfortunately, dealers generally do not recognize the provisions of their franchises as possible sources of some of their problems. Discussions with many dealers have convinced me that most dealers are almost totally unfamiliar with the provisions of their franchises. The technical legal wording typically used in franchises, of course, contributes greatly to this lack of knowledge.

For some dealers, franchises amount to a type of private lease that must be retained if the dealer is to stay in business. Alternative sources of supply may be limited or even nonexistent. To other dealers, having the franchise of a particular manufacturer may be relatively unimportant since so many others are easily obtainable.

In any event, franchises form the basic legal framework for manufacturer-dealer relations in many important industries. First, let us consider some of the general characteristics of franchise agreements. How widely do franchises vary between industries and within the same industry?

GENERAL COMPARISONS

Differences Between Industries

Of course, there is considerable variation in the provisions found in franchises in different industries. For example, the automobile dealer franchise is an exceedingly long and technical agreement covering virtually every phase of manufacturer-dealer relations. The close supervision automobile manufacturers exercise over their dealers is reflected in the many franchise terms calling for standardized practices by the dealers and for continuous reports to manufacturers.

In contrast, the typical petroleum jobber's franchise is fairly short and considerably less detailed. There is little evidence that the oil suppliers attempt to exercise any great degree of supervision over their jobbers.[7]

Some appliance manufacturers do not even use written franchises. It was not until January, 1957, that RCA Victor formalized its distributorship.[8]

Uniformity Within Industries

Although franchise differences are great between industries, the franchises used by different manufacturers in the same industry usually are markedly similar. The industrial revolution led to an age of mass production and mass markets. The key to success in this industrial age is the word "standardization." It is only logical that firms producing standardized goods, with standardized tools and standardized processes, should seek to standardize their distribution methods.

Material cost savings may result from using form contracts or agreements. And in addition to lawyers' fees and bargaining time also saved by standardized contracts there are

[7] In its most drastic warning to oil companies the National Oil Jobbers Council gave no hint of supplier coercion. See "Jobbers Warn They May Seek Government Help," *National Petroleum Week* (April 19, 1957), p. 10.

[8] Two documents, an "appointment letter" and a "policy statement" have been designed to stipulate the legal rights and liabilities of both parties.

definite administrative advantages. Professor Karl Llewellyn of Yale skillfully summarized these advantages as follows:

> "Standardized contracts in and of themselves partake of the general nature of machine-production. They materially ease and cheapen selling and distribution. They are easy to make, check and fill. To a regime of fungible goods is added one of fungible transactions. . . . One interpretation of a doubtful point in court or out gives a clear light on a thousand further transactions."[9]

The industrial revolution not only made standardization of contractual relationships logical but also made such standardization possible. The growth of large-scale manufacturing enterprises with "big threes" and "big fours" rising to dominance in many major industries put these dominant producers in the economic position of being able to insist that their own form contracts be used in their commercial dealings.

A quotation from a 1940 automobile dealer franchise case indicates that at times a dominant manufacturer may impose a harsh bargain:

> "An examination of its terms, which are many, indicates that it was dictated by the manufacturer at Detroit, and drawn by its counsel with the avowed purpose of protecting the manufacturer to the utmost and granting, if any, few rights to, and the smallest possible protection of, the agent."[10]

The dominant producers in the same industry tend to adopt similar franchise patterns not only because they have the bargaining power to do so but also because competition exerts pressure for uniformity upon them. A manufacturer could easily lose some of his best dealers to competitors if these competitors offered substantially better franchise terms. On the other hand, a manufacturer might find himself at a competitive disadvantage if he offered his dealers franchises substantially more liberal than those given by his competitors.

Although franchises vary considerably between industries, there are a few basic features that are typical of most franchises. A discussion of these typical features demonstrates how closely related franchises may be to some manufacturer-dealer problems.

TYPICAL FRANCHISE PROVISIONS

Duration

Most franchises appear to be of rather short duration. One-year agreements are fairly common. In the automobile industry, for example, General Motors, Packard, and American Motors have used one-year franchises. Oil jobbers generally have one-year franchises.[11] Filling station lessee-operators usually have one-year leases and supply contracts.[12] In the electrical products field, Philco and General Electric dealers and distributors have one-year franchises.[13]

Other franchises are of indefinite duration but typically contain express provisions giving either party the right to cancel the arrangement. The notice period may vary from immediate cancellation (coin-machine franchise) to 10 days (soft-drink franchise) to 30 days (a refrigerator-and-appliance franchise) to 90 days (automobile-dealer franchise).[14]

[9] "What Price Contract? An Essay in Perspective," *Yale Law Journal*, XL (March, 1931), p. 751.

[10] *Buggs v. Ford Motor Co.* (1940), 113 Fed. Rept., 2d ser., 619 (C.C.A., 7th cir.).

[11] John G. McLean and Robert W. Haigh, *The Growth of the Integrated Oil Companies* (Norwood, Mass.: Division of Research, Graduate School of Business Administration, Harvard University, 1954), p. 451.

[12] Copies of station leases and supply contracts may be found in *Gasoline Price War in New Jersey*, Pt. 3, pp. 463-68.

[13] For examples of one-year franchises in various industries see: *Falstaff Brewing Corp. v. Iowa Fruit and Produce Co.* (1940), 112 Fed. Rept., 2d ser., 101 (C.C.A., 8th cir.); and *Progressive Welder Co. v. Merton P. Collom* (1954), 125 F. Supp., 307-14 (D.C., 4th div.).

[14] See *Taran Distributing Inc., et al. v. Ami, Inc.* (1956), 237 Fed. Rept., 2d ser., 488 (C.C.A., 7th cir.); *Spur Bottling Co. v. Canada Dry Ginger Ale* (1951), 98 F. Supp., 972-82 (W.D. Ark.); *Motor Car Supply Co. v. General Household Utilities Co.* (1935), 80 Fed. Rept., 2d ser., 167 (C.C.A., 4th cir.). The Ford franchise is of indefinite duration, with a 90-day cancellation clause. The RCA Victor distributor is entitled to six months' notice.

Territory

Most franchises designate a territory in which dealers will be primarily responsible for sales. In earlier franchise agreements it appears that dealers usually were given exclusive selling rights in designated territories. The modern trend appears to be away from such exclusive grants; in current franchises, for example the Ford and RCA Victor franchises, manufacturers frequently reserve the right to sell to anyone anywhere as well as the right to appoint additional dealers at any time.

Exclusive Handling

Until recent years many franchises required that dealers handle only products produced, "authorized," or "approved" by their manufacturers. Recent antitrust cases raise serious doubts concerning exclusive dealing contracts. In 1949 the U.S. Department of Justice forced the automobile manufacturers to remove exclusive dealing provisions from their franchises.

Although dominant producers run great risk under the antitrust laws if they attempt to enforce exclusive dealing arrangements, the cases are an indication that exclusive dealing may be permissible in many situations.[15]

Stipulation of Amounts

Many franchises do not stipulate a definite amount of goods that the manufacturer agrees to deliver and that the dealer agrees to buy. This failure to stipulate amounts is in part due to economic uncertainties. In some cases neither the manufacturer nor the dealer can estimate with reasonable accuracy the volume of products that can or will be sold to consumers.

The court cases and other franchise provisions indicate there may be additional legal reasons for this failure to spell out the obligations of each party to the franchise. Many dealers have lost lawsuits against their manufacturers on the ground that the franchises were so indefinite that they were unenforceable as contracts. The courts usually are in sympathy with the causes of cancelled dealers; but the manufacturers win nearly all of the cases.

> "It appears that the plaintiff (dealer) has been disappointed in its expectations and has been dealt with none too generously by the defendent (manufacturer) but, while we sympathize with its plight, we cannot say from the evidence before us that there has been a breach of binding contract which would enable it to recover damages. While there is a natural impulse to be impatient with a form of contract which places the comparatively helpless dealer at the mercy of the manufacturer, we cannot make contracts for parties or protect them from the provisions of contracts which they have made for themselves. Dealers doubtless accept these one-sided contracts because they think that the right to deal in the product of the manufacturer, even on his terms, is valuable to them; but, after they have made such contracts, relying upon the good faith of the manufacturer for the protection which the contracts do not give, they cannot, when they get into trouble, expect the courts to place in the contract the protection which they themselves have failed to insert."[16]

As the above quotation illustrates, the franchises usually are drawn in such a way that dealers in effect must waive their legal rights as a condition of obtaining their franchises. Some oil suppliers even go a step further and include a clause in which dealers' rights under the antitrust laws are limited.[17]

Nature of Relationship

The legal classification of the relationship between manufacturer and franchised dealer can be extremely important. The courts usually have ruled that the choice in each case

[15] For a recent case see *Dictograph Products, Inc. v. F.T.C.* (1954), 217 Fed. Rept., 2d ser., 821 (C.C.A., 2d cir.).

[16] *Ford Motor Co. v. Kirkmyer Motor Co.* (1933), 65 Fed. Rept., 2d ser., 1002 (C.C.A., 4th cir.).

[17] *Gasoline Price War in New Jersey*, Pt. 3, p. 280. The clause provides that any dealer antitrust clause will be barred six months after the claim was accrued.

rests between declaring the dealer to be an agent and declaring him an "independent" buyer.

The following situations illustrate how important this question of legal classification becomes in particular instances:

- If a particular dealer is legally classified as an agent of the manufacturer, this could make the manufacturer legally responsible for all of the dealer's acts in operating the dealership.[18]
- If the dealer is an agent the manufacturer's tax liability might increase substantially.[19]
- If the dealer is an agent the manufacturer might be in a position to control the dealer's selling prices or practices with minimum risks under the antitrust laws.[20]
- If the dealer is an agent the manufacturer might have additional legal duties to compensate the dealer in the event the relationship is terminated.[21]
- In many states, if the dealer is an agent the manufacturer may be fined if he has failed to qualify to do business in the state.[22]

It appears that most franchises contain a provision stating that the dealer is *not* to act as an agent for the manufacturer. Unfortunately, the authorities are in disagreement as to how far such a clause goes in deciding this crucial issue.

It is believed that a large part of the confusion here may be attributed to the fact that many franchised dealers do not logically fit into either the agency or independent-vendee categories. Franchised dealers normally have more independence than agents but less independence than ordinary buyers on the open market.[23]

Other typical features in franchises include provisions which:

(*a*) give the manufacturer the right to change list prices at any time

(*b*) obligate the manufacturer to buy back new inventory (and parts) still in stock in the event of termination of the franchise

(*c*) provide that the franchise cannot be assigned (transferred or sold) by the dealer without the manufacturer's consent

(*d*) protect the manufacturer's property in his trade mark

RECENT FRANCHISE PROBLEMS

Dealer Criticisms

Some dealers have expressed their opposition to franchises of short duration. These dealers argue that such franchises are unfair in light of the size of the investments dealers are required to make and maintain in their dealerships. Under pressure of dealer criticism General Motors extended the duration of its franchises from one year to five years. Some gasoline service dealers currently are agitating for franchises of longer duration.[24]

Some dealers have criticized the short-term

[18] A classic case on this is *Joslyn v. Cadillac Automobile Co.* (1910), 177 Fed. Rept., 863-70 (C.C.A., 8th cir.). See *The Olson Manufacturing Company, an Idaho Corporation v. W. O. Roberts* (1955), 280 P., 2d, 433, for a more recent case.

[19] Federal social security taxes, chain store taxes, and workmen's compensation laws could be involved, as well as union difficulties. See *Hudspeth v. Esso Standard Oil* (1948), 170 Fed. Rept., 2nd ser., 418 (C.C.A., 8th cir.).

[20] See "Note," *Indiana Law Journal*, XXVII (Summer, 1952), pp. 524-29. It has been settled that manufacturers or suppliers have no right to control the resale prices of "independent" dealers except where the fair trade laws may be used.

[21] A manufacturer generally owes his agent the legal duty of reimbursing the latter for all reasonable expenditures incurred in carrying out the manufacturer's business. In addition, at least some courts rule that a selling agent has stronger legal rights under a franchise than does an independent dealer. See *Falstaff Brewing Corp. v. Iowa Fruit and Produce Co.*, 106.

[22] If a manufacturer has selling agents in a state, state law usually requires that the manufacturer register to do business in the state. See *Mario Florio, et al., v. Powder-Power Tool Corp.* (1956), 148 F. Supp., 843-46 (E.D., Pa.); and *Eclipse Fuel Engineering Company v. Superior Court of the State of California* (1957), 307 P., 2d, 739.

[23] For the view that management theory should recognize franchised dealers as a form of semi-integrated organization, see Valentine F. Ridgeway, "Administration of Manufacturer-Dealer Systems," *Administrative Science Quarterly*, I (June, 1956), p. 464.

[24] Short-term franchises and cancellation clauses were two of the principal complaints of auto dealers at the 1955 and 1956 hearings. See footnote 1 and "Should Station Dealers Have Long-Term Leases?" *National Petroleum News* (July, 1955), p. 41.

cancellation provisions found in many franchises. They argue that such provisions enable their manufacturers to coerce or force them (under threats of cancellation) into doing things they do not want to do.[25]

It is evident that the sales representatives of certain automobile manufacturers have at times exerted extreme pressure on some dealers. This fact can be documented by a study of the records made in Federal Trade Commission investigations, congressional hearings, and litigated court proceedings.[26]

There also is substantial evidence that certain oil companies have used cancellation threats as a means for pressuring their lessee dealers, and for accomplishing ends illegal under the antitrust laws.[27]

An article which appeared in *Business Week* in 1954 stated that appliance manufacturers go on loading their distributors with goods ". . . perfectly aware that these distributors, like car dealers, have to accept the overloading—or else."[28] It is doubtful that manufacturers generally have substantial economic power over the retail dealers in the appliance industry. Unlike car dealers, retail appliance dealers usually have numerous alternative sources of supply, and in metropolitan areas they usually carry the competing lines of several manufacturers.

The following quotation from a 1952 case, however, gives evidence that the economic position of some appliance distributors may closely resemble that of automobile dealers:

> "Under threat of termination of their franchises most of these distributors have been wrongfully coerced into an arrangement with the defendant (manufacturer) permitting them to sell the products included under the name of "Motorola" but prohibiting them from selling communication equipment manufactured by the defendant or communication equipment manufactured by others. The plaintiff (distributor) refused to submit to such an arrangement and his franchise as a distributor was cancelled resulting in the loss of a profitable business built up over a period of years."[29]

Manufacturers' Answers

The manufacturers argue that they too have a big investment, which they must protect. They insist that they must be free to dispose of unwanted dealers as they see fit. They also insist on their "freedom of contract" rights. Some manufacturers have stated that dealers do not distinguish between situations in which factory representatives use coercion and those in which factory representatives use only good salesmanship.[30]

On August 8, 1956 President Eisenhower signed into law a bill giving any franchised auto dealer a right to sue his manufacturer for damages in a federal court if the dealer can prove his manufacturer failed to exercise "good faith" in carrying out the franchise or in terminating it.[31] The duty to act in "good faith" is defined in the law as "the duty of each party to any franchise . . . to act in a fair and equitable manner towards . . . [the] other so as to guarantee the one party freedom from coercion, intimidation, or threats (thereof). . . ."[32]

It will be noticed that this law approaches

[25] *Automobile Dealers' Day in Court*, Senate Report No. 2073, Senate Committee on the Judiciary, 84th Cong., 2d sess. (Washington, 1956); and *Distribution Practices in the Petroleum Industry*, Pt. 4, pp. 143, 336, 337.

[26] See *Report on Motor Vehicle Industry*, House Document No. 468, House Committee on Interstate and Foreign Commerce, 76th Cong., 1st sess. (Washington, 1939); *United States v. General Motors Corp.* (1941), 121 Fed. Rept., 2d ser., 376 (C.C.A., 7th cir.); and *General Motors Corporation* (1941), 34 FTC, 58-86.

[27] See *Standard Oil of California v. United States* (1949), 337 U.S., 293-324; and *Richfield Oil Corp., Appellant, v. United States* (1952), 72 Sup. Ct., 665. Numerous antitrust cases are now pending or in trial against the petroleum industry. See "NCPR Hears 25% of DJ's Lawyers Work on Oil," *Oil Daily* (August 21, 1947), p. 1.

[28] "Price Cutters Grab the Ball," *Business Week* (April 3, 1954), p. 158. By permission of *Business Week*.

[29] Judge Rives dissent: *Nelson Radio & Supply Co. v. Motorola* (1952), 200 Fed. Rept., 2d ser., 916 (C.C.A., 5th cir.).

[30] L. D. Crusoe, Vice President of Ford, as quoted in "Auto Dealers Sound a Warning," *Business Week* (January 16, 1954), p. 28.

[31] 70 *U.S. Code* (1956), sec. 1222.

[32] 70 *U.S. Code* (1956), sec. 1.

the problem by giving each injured dealer a private lawsuit, contrary to the customary approach to economic problems in the past, when a regulatory commission was created. It will be several years before the results of this "good faith" law can be fully evaluated. The law has already had an impact, however. All automobile manufacturers, some oil suppliers, and a few other manufacturers have liberalized their franchises since the passage of this law.[33]

FUTURE TRENDS

All manufacturers and suppliers distributing their products through independent distributors and dealers should closely examine their franchises and dealer policies. It is my opinion that technological developments have put us (at least temporarily) in a position where our productive capacity exceeds our ability to consume. If this statement is true, it seems likely that strained relations between manufacturers and franchised dealers in many industries can be expected as manufacturers seek to gain greater sales and dealers resist the greater pressures exerted on them.

One eminent scholar predicted a long-run trend in franchise relationships in this way:

> "One would expect to find a trend toward limitation on arbitrary power gradually appearing through the entire field—whether it concerns franchises granted by Coca-Cola to a manufacturer-salesman, or dealer-company relationships prevailing between farm machinery companies and their outlets, or other like arrangements through the entire range."[34]

This problem of the existence of arbitrary power in some franchise relationships is only one of the problems in a broad, interrelated area.

What types of exclusive dealing arrangements are in the long-run public interest?

Are present antitrust laws concerning price discriminations adequate?

Would the public benefit if dealers were given a stronger legal status?

Franchises and franchise problems deserve more study. Perhaps new solutions can be found for some of the old problems that have bothered both manufacturers and dealers for many years.

[33] *Distribution Practices in the Petroleum Industry*, Pt. 1, p. 76.

[34] Adolph A. Berle, Jr., *The 20th-Century Capitalist Revolution* (New York: Harcourt, Brace & Co., 1954), p. 81.

> But the true community . . . depends for its genuine common life upon such cooperative activities that the individuals who participate in these common activities understand enough to be able, first, to direct their own deeds of cooperation; secondly, to observe the deeds of their individual fellow workers, and thirdly to know that, without just this combination, this order, this interaction of the coworking selves, just this deed could not be accomplished by the community.
>
> —*Josiah Royce*
> THE NATURE OF COMMUNITY

Is Thrift Outmoded?

An authority on savings gives evidence that Americans still believe in thrift—and try to practice it—in spite of the rise in instalment buying and in the various forms of social security.

GROVER W. ENSLEY

ANYONE who attempts to understand the forces operating in today's dynamic economy inevitably has to reckon with the current level of personal savings and to determine if this level is sufficient to meet an ever increasing demand for capital. Are Americans setting aside sufficient amounts of savings to permit adequate capital formation? Another way to phrase the question would be: Are savings today large enough to prevent the combined demands of consumers, government, and business from driving prices upward in an inflationary spiral?

It is obvious, I think, that only with a continuous supply of personal savings can our economy develop in a sound and healthy manner. Indeed, the whole structure of our personal level of living depends now, as always, upon investment; in a healthy economy, the modest personal savings of many Americans are at the very heart of capital formation and a sound investment program.

Our economy is an expanding one; as a nation we are dedicated to the goals of maximum employment and an increasingly higher level of living. These two conditions make it essential that extensive savings continue to flow into the productive economic activities—activities that will meet the demands of an increasing population for homes, goods, and services. Without personal savings, the demand for capital can be met only through an inflationary expansion of credit. And this, we trust, will not happen so long as the Federal Reserve Board is permitted to fulfill its responsibilities.

The thrift institutions that have been organized to accumulate such savings and to invest them in productive enterprises have the challenge of continuing to perform these significant functions at a time when the very heart of their activities—the will to save—is being seriously questioned.

From many quarters comes the cry that true savings are not coming in fast enough or in large enough quantities to meet the increasing demand for more and more capital funds. Government officials, such as William

McChesney Martin, Jr., Chairman of the Board of Governors of the Federal Reserve System, speak eloquently of "overspending" and "undersaving." Bankers, economists, corporation executives, labor leaders, owners of small businesses, and political commentators are all taking an active part in what has become a major debate.

Running through these discussions is one question, one theme that requires close examination. Have Americans lost their will to save? Has the instinct of the squirrel to store a supply of food been replaced by the instinct of the grasshopper to enjoy the feast of summer with no thought for the lean months of winter? Have the so-called cushions in our economy—social security, unemployment insurance, private health and medical plans, retirement programs—turned us into a nation of spenders, causing us to lose our *desire* to save as well as our *capacity* to do so?

HAS SAVING GONE OUT OF STYLE?

Writers for *Fortune* magazine,[1] in a report on the increase in mortgage and short-term indebtedness, have declared that Americans "do not really believe in saving," that we no longer consider thrift one of the virtues of a well-organized life. A report in *Business Week* describes the American consumer as one who "spends practically everything he makes." Joseph Wood Krutch has dramatized this debate of savings versus spending: "It's amazing the things women would rather have than money."

If these commentators are correct, if thrift and saving really are going out of style, it is a matter of utmost concern. But before accepting this doleful conclusion, it might be well to examine some pertinent facts.

First, the data on net personal savings as measured by the Department of Commerce are reassuring. Net personal savings as listed in the Department's *National Income and Product* accounts totaled $20 billion in 1956.[2] This was the highest since the war years, when scarcities of goods and appeals to patriotism combined to run up abnormally large aggregate personal savings. In 1956, personal savings accounted for 7.0 per cent of disposable personal income. This percentage is not quite so high as it was in the early 1950's, but it is up from the 5.8 per cent of 1955 and notably above the immediate prewar rate, which averaged 4.5 per cent.

The Effects of Inflation

Of course, these figures leave no room for complacency. Longer-range inflationary tendencies require a higher level of savings. By saving more we reduce the pressures in the consumer markets and help to meet legitimate capital demands to sustain economic expansion. With the general level of prices remaining stable, individual prices will fluctuate in response to their proper economic function of allocating economic resources where they are most needed, and where they will contribute most to the welfare of society. A stable dollar will also reduce the significance of hedges that currently are being used by some as protection against a steady decline in the purchasing power of the dollar. These hedges—real estate speculations and purchase of equities, either through mutual funds or by direct purchases of stocks by individuals—only contribute to creeping price advances and penalize the many to enrich the few.

But unfortunately there are some who, under inflationary conditions, will be tempted to risk their savings in equities in order to win the fight against future price advances. We have already seen how inflation in several foreign countries has caused a flight of savings from the thrift institutions. In Finland, where prices have risen 25 per cent since the beginning of 1956, depositors have

[1] See Gilbert Burck and Sanford S. Parker, "The Danger in Mortgage Debt," *Fortune*, LIII (April, 1956), pp. 124-27 ff.

[2] Office of Business Economics, U.S. Department of Commerce, *Survey of Current Business*, XXXVII (July, 1957), p. 29, table 47.

been withdrawing their savings from savings banks, commercial banks, and similar organizations to such an extent that these institutions have established special savings accounts that increase with any rise in prices. This act of desperation did indeed bring depositors back to the banks, but at the same time prices continued to rise, and only recently Finland had to devaluate her currency by 39 per cent. Thus inflation and the level of personal savings are inextricably bound together.

The Persistence of the Thrift Ideal

To return to the original question: Is thrift becoming outmoded? We have seen that net personal savings in 1956, while not completely satisfactory, were certainly not alarmingly low. A study recently completed by Professor Milton Friedman of the University of Chicago[3] indicates that savings in the United States over the past 60 years have remained a remarkably constant percentage of income. Friedman also finds that over the past six decades there have been no basic changes in the spending and saving habits of the United States consumer. Therefore the instinct to save, at least in a statistical sense, has not become dormant.

But how strong is that instinct and how does it express itself? A study of attitudes toward savings and borrowing,[4] made by Dr. George Katona and the Survey Research Center of the University of Michigan and recently reported by the Federal Reserve Board, is most revealing.

The survey attempted to analyze the motives, attitudes, and opinions of American consumers as they influenced the borrowing and savings of these consumers in 1955 and 1956. On the basis of interviews, the survey revealed that the desire to save was a positive factor in the thinking of the American consumer. True, some of those who said they believed in the value of saving did not back up their belief with actions, but the desire to save was very much there.

Therefore, the thrift ideal still ranks high with the families of the United States. It is neither outmoded, nor, as the *Fortune* writer declared, considered "un-American."[5] Indeed it is a highly valued and important goal in life, and those who do not put aside savings greatly regret it.

The Effects of Instalment Buying

Many believe that the ease of instalment buying has made it practically unnecessary for people to save for the purchase of a new car or for a major piece of household equipment. The increase in consumer indebtedness is frequently blamed for a decrease in personal savings. For example, the *Wall Street Journal*, in its news story on the Federal Reserve's 1956 *Survey of Consumer Finances*, featured the rise in mortgage debt and short-term credit; but the other significant finding of the survey—that consumer holdings of liquid assets also increased in spite of the high level of consumer spending and large acquisitions of nonliquid assets—was not included in the story.[6]

The argument that instalment buying has decreased the will to save is questioned by the findings of the University of Michigan survey. This report found that those families that purchased durable goods on the instalment plan were also the families that saved. Although it is not surprising to learn from the survey that higher income means greater purchase of durable goods on instalment, it is reassuring to learn that savings also are higher with higher incomes. Therefore, it cannot be assumed that those who use instalment

[3] See Milton Friedman, *A Theory of the Consumption Function*, National Bureau of Economic Research, General Series No. 63 (Princeton, N.J.: Princeton University Press, 1957), chap. 5.

[4] George Katona, "Federal Reserve Board Committee Reports on Consumer Expectations and Savings Statistics," *Review of Economics and Statistics*, XXXIX (February, 1957), pp. 40-45.

[5] See Burck and Parker, "The Danger in Mortgage Debt."

[6] For a discussion of this, see Board of Governors, Federal Reserve System, "The Financial Position of Consumers," *Federal Reserve Bulletin*, XLII (June, 1956), pp. 559-72.

buying habitually are also in the habit of reducing their savings. Conversely, it cannot be said that those who do little borrowing are the ones who increase their cash holdings.

The Effects of Other Kinds of Security

Another reason often given for a slackening in the will to save is that social security and private pension and retirement plans no longer make it necessary to save in traditional ways for periods of unemployment, sickness, and old age.

But is this reasoning valid? In the first place, social security benefits and private pension plans provide only minimal protection. Studies by the Institute of Life Insurance[7] indicate that people with such protection carry larger life insurance policies than people with similar incomes who are not protected by social security benefits. Between 1951 and 1956 private insurance and pension funds increased over 51.5 per cent, while government insurance and pension funds increased 40 per cent.

This substantiates my belief that the average American is willing to work hard to raise his level of living, not only for the next year but for periods of leisure and for his future years of retirement. Social security benefits have not weakened his desire to be self-reliant, nor have they diminished his desire for a materially better life.

WHY DOES THE AMERICAN SAVE?

The desire to save then is still very much a characteristic of the average American. Instalment buying and collective security benefits have not dulled his drive to put something away. But for what does he save and where? In a period such as the present, when money is tight and rates of interest are rising, it might be argued that income from saving is one of the important reasons for saving. There is, however, apparently no simple cause-and-effect relationship between higher interest rates and an increase in the amounts saved.

Economists, in fact, hold widely divergent views on the responsiveness of savings to interest rate changes. In a survey of the views of leading economists and financial experts,[8] *Business Week* found that half of the experts questioned felt that such response was slight at best. Others either offered qualified acceptance of the view that interest rates were a determinant in the amount of savings or felt that the evidence was too inconclusive for judgment.

Apparently, very few people save expressly for the purpose of earning income upon their savings. The University of Michigan study revealed that only 1 per cent of the families surveyed mentioned income from savings as even a partial reason for their personal savings programs. While saving for a "rainy day" or emergencies such as illness, unemployment, or accident was mentioned by 45 per cent of all income groups; 66 per cent of all income groups said they saved for specific goals; and, for those in the $7,500 to $10,000 income group, 72 per cent saved for specific goals. These specific goals included retirement, children's education, buying a house, and purchasing consumer durables.

One of the largest mutual savings banks in the United States—the Philadelphia Saving Fund Society—recently completed a motivational research study that revealed similar reasons for savings.[9] The survey showed that people in the Philadelphia area save for the purchase of a house, the education of a child, Christmas expenses, vacation costs, and old age. Individuals save, the PSFS survey concluded, not because they are under the same vague moral pressure to practice thrift that may have motivated our great-grandparents to practice thrift, but because they have in

[7] Institute of Life Insurance, *Life Insurance Fact Book 1957* (New York: Institute of Life Insurance, 1957), p. 16.

[8] "Does Higher Interest Lure More Money into Savings?" *Business Week* (March 16, 1957), pp. 190-92 ff.

[9] For a thorough report on this study, see "Merchandising Savings," *Burroughs Clearing House*, XLI (January, 1957), pp. 24-25.

mind some specific material advancement in their standard of living. The average American wants a well-equipped home, a good car, an education for his children, and a comfortable, secure retirement. He is willing to work for these things and, happily, he is willing to save for them.

These are heartening forces in the American economy. It is the responsibility of all guardians of the personal savings of the average American to turn this desire to save into the positive act of saving. How can this be accomplished?

ENCOURAGING THE DESIRE TO SAVE

I suggest that one way is to put to good use the information contained in surveys such as those conducted by the University of Michigan, the Federal Reserve, and the PSFS. It is self-evident, I think, that institutions that accommodate themselves to the psychological attitudes and motives for borrowing and saving of the average American are the ones that will be chosen by the individual for his savings.

The American family of today wants to meet its financial obligations in an orderly, scheduled manner. As the family dollar comes in, it is carefully apportioned to the monthly mortgage, the car payment, the insurance premium, and, we trust, to the personal savings account. Apparently, the savings account that has a specific purpose is the one that will win out over others.

Since we know it is easier and more convenient for the average American to save regularly for a specific reason, why not put this knowledge to work?

The Philadelphia Saving Fund Society has already applied the results of its study by establishing special-purpose accounts that are designed to make it easier for depositors to save for a specific purpose. The value of these accounts, when promoted vigorously, has been amply borne out by the bank's experience during the past year. Not only have a great number of these special-purpose or convenience accounts been opened, but these accounts, according to the latest report from the bank, have been a psychological and promotional instrument in stimulating new business in many areas of the bank's operations. These convenience accounts have served as a stimulus to the incentive to save and have been a motivating force behind new business collectively. I think that such success calls both for admiration for the innovator and for imitation by others.

By providing specialized outlets for the specialized savings needs of the average American, mutual savings banks and the other traditional thrift institutions can effectively influence the aggregate of savings in the United States.

There is still much to be learned about the thrift habits and the savings potential of our rapidly increasing middle-income population. Bankers, investment organizations, legislators, public and private leaders—all have the responsibility of discovering the savings needs of the average American. On the basis of these discoveries, we can develop new techniques for guiding and encouraging the instinct to save, an instinct that is neither outmoded nor "un-American."

> BE *industrious* and *free;* be *frugal* and *free.* At present, perhaps, you may think yourself in thriving Circumstances, and that you can bear a little Extravagance without Injury; but,
>
> *For Age and Want, save while you may;*
> *No Morning Sun lasts a whole Day,*
>
> as *Poor Richard* says. Gain may be temporary and uncertain, but ever while you live, Expence is constant and certain; and *'tis easier to build two Chimnies, than to keep one in Fuel,* as *Poor Richard* says. So, *Rather go to bed supperless than rise in Debt.*
>
> —*Benjamin Franklin*

Can risks once considered uninsurable actually be insured? Here are the pros and cons of "chronological stabilization" insurance.

Stabilizing Income Through Insurance

JOHN D. LONG

A NOVEL suggestion was made recently in an insurance trade journal. An actuary suggested that the device of insurance be used much more extensively than at present to stabilize business earnings.[1]

A casual observer of the current magnitude of insurance premiums might feel that the device was being used to the near maximum already.[2] According to the actuary's suggestion, however, additional insurance premiums could be used to buy a new type of coverage designed to provide a substantial measure of long-run stability in business operations. The new type of coverage is called "chronological stabilization" insurance.[3]

The central idea is two-fold:

- Risks heretofore considered uninsurable may really be insurable after all.
- These risks may be better handled by insurance than by mere reservations of earnings of individual firms. Each part of this two-fold idea will be examined in turn.

NEW AREAS OF INSURABILITY?

Since its inception, insurance has been applied to a multitude of hazards. Centuries ago it was adapted to perils of the sea and to risks of fire and death. Since then it has been expanded in many directions. Currently, for

[1] See "Chronological Stabilization, Which Is Insurable, Desired by Corporations," *The National Underwriter*, LXI (July 18, 1957), pp. 15, 19-21. This article is a digest of a speech made by Orieon M. Spaid, President of Actuarial Service Corporation of Summit, New Jersey. This idea is explained further in "Insured Chronological Stabilization Plans," *The National Insurance Buyer—Corporate Insurance Management, IV* (September, 1957), pp. 16, 28 ff.

[2] For example, in *Best's Insurance Reports (Fire and Casualty)*, (157th annual ed.; New York: Alfred M. Best Company, Inc., 1956), p. *ix*, the premiums for insurance sold in 1955 by stock companies alone was estimated to exceed 7½ billion dollars. Perhaps well over one-half of this amount was paid for protection of business properties.

[3] According to a brochure published by the Empire Insurance Company, Ltd., 283 Duckworth Street, St. John's, Newfoundland, and entitled "Chronological Stabilization Insurance: The Answer to Corporate Management," such coverage is in fact now on the market.

example, it is being extended on a gigantic scale to the risks of radiation damage to property and life by privately built and operated atomic reactors.

In each case two fundamental operations have been performed:

- Uncertainty of economic loss has been reduced by prediction.
- Costs of losses have been distributed among the interests involved. The prediction of losses is made on the basis of simple historical probability, tempered with judgment. Insurance has been most successful where a large number of reasonably homogeneous units have permitted reliable prediction.

Some risks have never been the object of widespread insurance treatment. Business managers have been forced to provide for these various "contingencies" in other ways, notably by the prudent practice of retaining business earnings. Strikes, floods, unexpected technological obsolescence, and patent infringement are examples of such contingencies. Other examples are: shrinkage of security or real estate investment value, conversion of foreign currency at unfavorable rates, and increased longevity of pensioned employees in a self-administered retirement plan. The uncertainties inherent in these contingencies have seemed to defy prediction and thus lie beyond the pale of insurance.

The suggestion that these contingencies are insurable is based on the idea of long-run averaging. The economic loss to a firm through, say, a strike in a given year is not satisfactorily predictable. Even the economic loss to many firms through a single contingency such as strikes over many years may not be predictable. Nevertheless, the economic loss to many firms because of strikes, floods, adverse market shifts, and other contingencies over two or more decades may be predictable and ratable for insurance purposes. Implication is made, moreover, that the rating could be refined enough to recognize distinctly the differences among firms in the degree of aggregate risk faced by the firms.

From one point of view such a remarkable insuring system actually would involve no new principles. Members of Lloyd's of London have been measuring *dissimilar* risks "over time" for centuries and have been issuing coverages accordingly. Rates for various coverages are established in such a way as to be adequate in the *long run*. Some coverages are sold that could not by any stretch of ingenuity be rated accurately on an individual and isolated basis. When fitted into the over-all sequence of Lloyd's risks, however, they can be rated on a practical basis. An example is the contract made covering loss to certain merchants in case of a change in the announced route of the coronation march of the Prince of Wales. Some observers might insist that such an agreement is merely one of gambling and not one of insurance at all. Insurance scholars might disagree by pointing out that (1) gambling requires the possibility of either party to the wager winning and (2) the merchants in this case could not "win" anything. The indemnity contract merely protected them from losing. The significant point here, however, is that, regardless of whether the contract was one of insurance or wager, the rating problem required solution.

The cited articles[4] on chronological stabilization insurance also suggested an adaptation of the "retrospective" rating technique. To insurance men this technique means adjusting the premium, within minimum and maximum limits, on the basis of the loss experience of a given policyholder during the period to which the premium applies.[5] While retrospective rating traditionally is associated with "self-insurance," in the case of chronological stabilization plans, it represents a compromise between insurance and no insurance. Chronological stabilization-type losses cannot be predicted reliably within individual firms. Insurance, therefore, would exist only for

[4] See footnote 1.

[5] See J. Edward Hedges, *Practical Fire and Casualty Insurance* (6th ed.; Cincinnati: The National Underwriter Company, 1954), p. 190, for a technical discussion of retrospective rating.

losses below the minimum and above the maximum retrospective limits. Without the minimum and maximum limits the contract would produce purely a "cost plus" pattern of payments to the policyholder and would contain no insurance element at all.

Presumably the policies could be offered on a "participating" basis with excess premiums refunded periodically as the excesses become apparent. This practice is common in other areas of insurance. A deductible feature also might be used to relieve the insurer of all claims except those of catastrophic size.

ADVANTAGES OF USING INSURANCE

The second part of the two-fold idea stated in the introduction now deserves consideration. This facet concerns the question of whether contingency risks might be handled better with insurance than without it, assuming that such risks are insurable in the first place.

Basis of Comparison

Any judgment as to whether or not one thing is better than some other thing embodies overtones of ethics. Some point of reference must be established for exercising the judgment. The base assumed for this discussion is the long-run maximization of profits of the individual firm.

The most likely alternative to insuring contingencies is merely that of absorbing them out of retained earnings.[6] By definition, contingency losses can be much larger than current earnings could absorb. The comparison here then is restricted to *insurance* as opposed to *retention of earnings*. The comparison is focused first on stability and next on cost. The cost analysis is made initially with no consideration of taxes; tax consequences are then anticipated.

[6] The same amount of preventive effort is assumed in each case.

Stability of Income

Custom and laws require an annual accounting of a firm's operations. Some costs, such as those for utilities, may be fairly regular from year to year. Other costs are no respecters of calendar or fiscal years, because the firm's activity does not ebb and flow in perfect unison with the calendar. Among costs in this group would be those stemming from the contingencies already discussed.

The emphasis on annual operating results actually is unrealistic. Accountants are asked to perform near miracles in matching expenses against revenues during an artificially defined segment of a firm's continuous stream of activity. The accounting profession is to be commended for the systems of deferring, accruing, depreciating, depleting, amortizing, and discounting it has developed and refined.

Even with these tools, however, annual figures are only estimates. Perhaps the real profit or loss can be known only historically, after the firm has ceased operations. Inputs in dollars or dollar equivalents can then be matched against dollar outgo to ascertain the net profit or loss. Even here adjustments will have to be made to account for the changing value of the dollar or other monetary unit used for measurement. Conceivably, every input and outgo could be in monetary units of different value.

Recognizing the estimative nature of annual accounting, business managers must examine "profit" figures in the income statements with circumspection. Realizing that some costs of doing business do not run on an annual basis and cannot be accrued by an individual firm, prudent managers simply reserve some earnings. Of course, earnings also may be reserved for reasons other than that of absorbing contingency losses. Unfortunately, the reservation has to be made in after-tax dollars. The lack of finality in the profit or loss figures reported on an annual basis is a definite management problem.

If all or even some of the common "business contingencies" could be insured on an equitable premium basis, annual operation

figures might assume more meaning and more stability. The difficulties of annual accounting might be lessened somewhat. Cost of contingencies which otherwise could not be accrued or deferred could be spread over many accounting periods. The firm would be buying protection against economic loss from "contingencies" just as it buys protection against its fire and liability hazards.

The substitution of insurance protection for retained-earnings protection might remove some causes of troublesome fluctuation from the annual income and net worth figures of a business firm. The result might ease somewhat the task of forcing business operations into the ill-fitting cloak of annual accounting.

Cost of Meeting Contingencies

Cost is the second basis for comparison of insurance and retention of earnings as ways of meeting contingencies. The first considerations presented in this comparison do not take tax factors into account; subsequent ones do.

Nontax Cost Comparisons

From the standpoint of an individual firm, insuring contingencies could be much, much cheaper than absorbing them with retained earnings. On the other hand, if the firm suffers relatively few or no insured losses, insurance could become much more expensive to the firm than noninsurance. Insurance is simply the substitution of a relatively small certain for a large uncertain loss.

From the viewpoint of the whole insured community of business firms, insurance would require a larger aggregate outlay of premiums than the sum total of losses covered. This excess would come about through costs of running the insurance machine, through taxes on the activity, and perhaps through profit to the insurance company. This type of insurance, like every other type, is enjoyable by society only at a price. In a competitive society this social price falls as the efficiency of the insuring mechanism increases.[7]

The existence of a social cost does not mean that insurance is necessarily the more expensive way of handling the contingencies that have been discussed. Two additional ramifications should be considered. First, use of insurance by a business manager might release some contingency funds being accumulated by his firm. If the hazards are insurable, an insurance company could provide a given "levee" of protection with a smaller amount of funds than the total funds needed by all firms on an individual basis. Upon release, these funds presumably can be used more profitably either by the firm or by the stockholders. Any increase in the yield on such released contingency funds, formerly held in sterile or low-yielding assets, would reduce the real cost of using insurance by increasing the efficiency with which business capital is used. The earning differential could be sufficient or more than sufficient to offset the social cost of insurance. This speculation is, of course, an unproved point, but it is one that is certainly worthy of more investigation.

The second ramification here involves a marginal-utility approach to economics. The marginal utility of assets used to meet contingencies may be much less through insurance than otherwise. With insurance, each insured firm will regularly spend a relatively small amount of money for premiums. Without insurance, a few firms will lose crippling amounts of money or other assets when the catastrophes strike. Even though all firms could, over time, pay out more dollars with insurance than without it, the lost marginal utility in the period could still be less with insurance than without it. Whether or not a business manager should think in broad terms of marginal utility is a question in itself. Still, his firm might be the one a catastrophe cripples. In such a case he would be painfully

[7] Increased premium taxes might prevent the price to the insured firms from falling. Still, the social cost would fall.

reminded of this simple but profound principle of economics.

Tax Cost Comparisons

Another aspect of the cost comparison is the difference to an individual firm in the federal income tax treatment of the insurance method and the retained-earnings method of handling contingencies.

If the firm employs the usual retained-earnings method, the contingency fund has to be built out of after-tax dollars. Roughly, two dollars of earnings are required to put one dollar (in cash or highly liquid securities) into the contingency fund. When contingencies do occur, losses usually can be offset against the income of the period to the extent of the adjusted basis of the assets lost.[8] If the income is insufficient to absorb the loss, the undeducted portion can be carried over within limits to be applied against income of other periods.[9]

If insurance were used to provide protection against contingencies and if the premiums satisfied Section 162 of the Internal Revenue Code,[10] the premiums would be deductible. When a loss occurs, the portion covered by insurance proceeds is not deductible. Any uninsured part of the loss can be treated as if it were not insured. Any excess of insurance proceeds over the adjusted basis of the assets lost is, with some exceptions,[11] taxable as an ordinary or capital gain.

The gist of the difference in tax treatment is that:

(1) costs of contingencies absorbed by retained earnings are deductible only after the contingencies occur, while

(2) costs of contingencies absorbed by insurance proceeds are deductible when the premiums are paid—*provided* that the premiums meet the test of IRC, Section 162.

The difference may appear to be—and ultimately may be—quite superficial. The possibility exists, however, that a given firm may not receive the full tax benefit of a loss absorbed by retained earnings. The income of the period may not be large enough to absorb it. Even with loss carry-over provisions, the loss may conceivably be larger than any income against which it might be applied.

Of course, the same reasoning might hold for deductibility of insurance premiums. The relative magnitudes, however, have a bearing. Because of the tremendous size that a contingency loss can assume, the probability of enjoying the full tax benefit of premium deductions seems much higher than the probability of enjoying the full tax benefit of all uninsured contingency losses. Perhaps few if any firms would fail to enjoy the tax benefit of all premium deductions.

[8] *Int. Rev. Code of 1954*, § 165(a) and § 165(c).

[9] Section 1211(a), of the Internal Revenue Code of 1954 provides that for a corporation, "losses from sales or exchanges of capital assets shall be allowed only to the extent of gains from such sales or exchanges." A net capital loss, therefore, is not deducted in the year sustained. Section 1212 provides that a net capital loss shall be carried forward as "a short-term capital loss in each of 5 succeeding taxable years to the extent that such amount exceeds the total of any net capital gains of any taxable years intervening between the taxable year in which the net capital loss arose and such succeeding taxable year." If the contingency loss should somehow be construed to be a net operating loss, the net operating loss may be carried back to the preceding two years and carried forward for the five years immediately following [*Int. Rev. Code*, § 172(b)(1)].

[10] The relevant provision reads as follows: "There shall be allowed as a deduction all the ordinary and necessary expenses paid or incurred during the taxable year in carrying on any trade or business. . . ." [*Int. Rev. Code*, § 162(a).]

[11] Section 1231 of the Internal Revenue Code provides, among other things, that no gain shall be recognized on an involuntary conversion of property if the amount realized in proceeds equals or is less than the cost of replacing the asset [*Int. Rev. Code*, § 1231]. The replacement, however, must be completed, unless an extension is granted, within one year from the date of the loss. Also, the replaced asset must take the same basis as the one which was lost [*Int. Rev. Code*, § 1033(c)]. For example: If a taxpayer received $100,000 in insurance proceeds for loss of a building with an adjusted basis of $20,000, and if he spent $100,000 in replacing the building, he would have no recognized gain, provided that he chose to exercise the option provided by this section. The replaced building would have a tax basis of only $20,000.

EVALUATION

Speculation about the future of chronological stabilization insurance hinges on the question whether or not such coverage is really ratable. If the coverage is or can become ratable, competition in the insurance industry could lead quickly to equitable and efficient pricing. The answer to the ratability question in turn ultimately depends on whether or not losses of the contingency type can reasonably be predicted.

Skeptics might hastily conclude that such prediction within any useful limits of accuracy is utterly impossible. They might be right. Business technology, labor relations, international finance, and other rate ingredients might be changing so fast as to defy any prediction. If this is the case, chronological stabilization plans could operate only on the basis of complete retrospective rating. As suggested in an earlier section, this type of rating would mean that chronological stabilization plans would be merely banking and not insurance devices. A business firm would not be able to transfer any of its risk; it would transfer only the temporary custody of some of its contingency funds. The only virtue of such a plan might be a postponement of—or conceivably a decrease in—tax liability, assuming full deductibility of "premiums." Even this virtue would be at the expense of using about 5 per cent of the "premiums" as expense of administering the plan.

If, on the other hand, contingency losses *can* be predicted within tolerable limits, the case for chronological stabilization plans as *insurance* becomes much stronger. The prospect exists that the social cost of meeting contingencies might be reduced through increased efficiency in the use of capital. Also, in terms of marginal economics, spreading of losses could mean that the real cost of contingencies would be reduced.

Another advantage of a widespread use of chronological stabilization insurance might be the increased credibility of annual operating figures. With insurance to absorb at least some contingency-type losses, annual income statements and balance sheets might be accepted somewhat more nearly on face value.

Finally, the possibility, mentioned earlier, of postponing or conceivably decreasing tax liability would, of course, still exist. Tax laws are subject to sudden and drastic change. The relevant sections might be interpreted or expressly spelled out to disallow deductibility of premiums paid for chronological stabilization insurance. Until such deductions are denied, however, this proposal, assuming ratability, is intriguing from the tax standpoint.

Because of rating difficulties or other obstacles, chronological stabilization insurance may never flower. On the other hand, it may grow into a useful management tool of the future. Since to some extent "the consumer is king" even in the insurance market, business managers might do well to study this proposal carefully.

> THE body travels more easily than the mind, and until we have limbered up our imagination we continue to think as though we had stayed home. We have not really budged a step until we take up residence in someone else's point of view.
>
> —*John Erskine*

Decisions

Behind the Edsel

A new facet of the Edsel story is explained by Mr. Judge, who tells of the role of college research organizations in the development of this car.

J. Emmet Judge

The Ford Motor Company has just introduced a new automobile to the American public—the Edsel. The program has had great business significance because it involves the investment of $250 million by the Ford Motor Company. Because Americans like automobiles, it has had great anticipatory interest for the public. Both of these stories have been told and retold.

Another interesting story is the research behind the Edsel, and the particularly important part of this undertaking is the work that has been done by three college organizations. The Ford Motor Company is proud of this association—the union of the talents of the academic fields with those of industry.

We in industry never cease to learn. We are constantly finding new things about the market we serve. Many of these new discoveries are due to changes in the market itself—but they are due even more to the fact that we have found new ways to analyze and study the market. New techniques of market research have brought forth facts of which we previously were completely unaware.

In planning the Edsel program, we called on the help of three academic organizations: the Bureau of Applied Social Research of Columbia University, the National Opinion Research Center of the University of Chicago, and Research Associates of the University of Michigan.

WHY AN EDSEL CAR?

Before discussing the specific research programs, some background is desirable. First, why an Edsel car? Although the Ford Motor Company is the second largest producer of automobiles, and currently has 30 per cent of the total market volume, we have been predominantly a low-priced car producer. About

80 per cent of the total volume of the company has been in the Ford car with 20 per cent in the Mercury and Lincoln.

In the case of both General Motors and Chrysler, 50 per cent of their volume is in their low-priced cars—Chevrolet and Plymouth, respectively—and 50 per cent of their products are in the medium and high markets.

Each of the three major companies has one car in the high-price field. But in the medium area, General Motors has three—Pontiac, Buick, and Oldsmobile; and Chrysler has three—Dodge, DeSoto, and Chrysler.

With their great variety of products in the medium market, these producers do a substantially greater portion of their business in this area than does the Ford Motor Company.

The significance of this pattern is reflected in the importance of the medium market today; over 60 per cent of the industry volume is in the medium market. This includes not only the cars that are traditionally in this area, but also the low-price three, of which the upper models are actually priced in the medium market.

People who buy in the medium market want a broader choice of product. Car owners are constantly moving from the low-price field to the middle market. Our former Ford car owners who "graduate," as we call it, are looking for a wider selection in medium cars. With the Edsel in the middle market, we will be able to hold more of these moving owners within the Ford family of products.

After the decision to produce a medium-price car had been made, the question then became: What *kind* of a medium-price car should Ford produce and how should it be presented to the market? The Edsel was to enter a highly competitive market, and the buyers in this market are discriminating. The automobile is an important part of American living—it supplies not only the transportation needs of people, but its purchase and ownership is also tied to many psychological and emotional desires.

In short, the questions for research were:

How do people perceive various existing makes?

What mental stereotypes do they have of the various existing makes?

What personality would be best for the new Ford Motor Company car to possess in order to offer greatest attraction to Ford up-traders?

What would be the best personality to compete with other medium-price makes?

RECOURSE TO THE UNIVERSITIES

We turned to Columbia University for some of these answers. For some years, the Graduate Sociology Department of Columbia has operated a Bureau of Applied Social Research. To fill its role as a training laboratory for graduate students, and to keep faculty members in touch with actual problems of sociological behavior, the Bureau undertakes outside research that has true academic substance.

The Bureau's interests center largely around the sociological aspects of status symbols, reference groups, and the dynamics of influence. All of this is definitely involved in the problem of how best to merchandise a new medium-price car.

Thus, the interests of Ford Motor Company on one hand, and of the Bureau of Applied Social Research on the other hand, were almost exact complements of each other. There was little difficulty in establishing a partnership of mutual interest between the two parties.

By commercial standards, the survey itself was an extensive one. In both Peoria, Illinois, and in San Bernardino, California, one hundred recent buyers of each of eight makes of cars were interviewed. Thus, the total respondents were 1,600 recent car buyers. These particular cities were chosen because they offer a sharp contrast to each other—one a relatively quiet, established city in the Midwest, and the other a rapidly expanding city in the dynamic Far West.

What, now, of the results? For the Edsel Division, they provided an invaluable blueprint of the perceptions of makes of cars among various classes of automobile owners. We found that some existing cars have

stronger association with ownership by young people, some by older. Certain makes are considered more masculine than others. In the very important area of prestige, there are some cars whose ownership is associated with positions of financial or professional success—others are viewed more as the workingman's car.

Knowing these things about people is all-important in developing a new product and marketing it. Our knowledge of the automobile customer, gathered through market research, formed the basis for our concept of the Edsel. To make a maximum impact on the market, we decided that it had to be a car with particular appeal for the "young American family on its way up."

RESEARCH IN ADVERTISING AND MERCHANDISING

Our advertising and merchandising appeal follows the same basic approach. This is an aspect of our program of which we are particularly proud: Market research has had an important part in the Edsel program, and the results of this research carry through every step from the car itself to the way in which it is presented to the customer.

With the help of the National Opinion Research Center of the University of Chicago, we probed the automobile customer in other ways. We wanted to find out how strongly he feels about all the makes in the market, but most particularly about the one he owns. How important is this factor of owner loyalty? How can it be broken down?

Automobiles are produced by a few large manufacturing companies, but they are distributed through a wide network of independent businessmen called retail dealers. In the automobile industry we have been aware for many years of the importance of the dealer-customer relationship. We know that it is courteous and adequate treatment that brings the customer back for repurchase of the same make of car he has owned. The performance of the dealer is more important in retaining a customer than are the total resources of the manufacturer in styling and engineering.

To get a basic understanding of this relationship, we instituted a study with Research Associates at the University of Michigan. This study involved an analysis of the fundamentals of this dealer-customer relationship.

We asked individual automobile consumers how they felt about automobile dealers and what they considered to be the ideal image of a dealer, taking into consideration such factors as his degree of success, his participation in the sale, his position in the community, and the kind of people he knew socially. To every automobile owner, service and keeping the car in satisfactory repair are important. But we also wanted to know the importance that is attached to being treated with respect.

The study brought forth many interesting factors. In any business relationship, respect for human values is important. However, we did not realize the exceptional importance that customers attach to meeting these needs. To many, courteous treatment was more important than the financial implications or the "deal" they received in purchasing a car.

The information gained from this study has been used to effect a better understanding among our dealers of the importance of the proper psychological approach to selling.

In addition to these studies, which were made prior to the introduction of the car, we have a continuing program for intermittent measurement of the acceptance and the impact on the market of the new Edsel car.

These measurements are also being carried out with the help of Columbia University, and they will continue for a period of about one year. Because we are introducing a new product, we have an unusual opportunity for constantly evaluating our progress. This is being done in a number of cities throughout the United States by utilizing a technique that is new to this field of work.

We contacted a group of individuals in these cities in the early fall before the introduction of the Edsel, and we are returning intermittently to these same people to find out what changes have occurred in their

feelings toward the product and the company as the car gets better established in the market and as our advertising takes effect in forming a public attitude.

UTILIZATION OF ACADEMIC RESOURCES

These are examples of the Edsel Division's experiences in the utilization of college organizations for market research. We realize that our program was particularly adaptable to utilization of their services. However, we are convinced that throughout industry there are many similar situations in which tremendous advantage can be gained through a cooperative effort of this type. Still, there are certain considerations of this type of joint activity that should be made both by industry and by the colleges.

Certain basic understandings are important. The university must recognize that business is a profit-making institution. The fundamental purpose of business is to provide a profit return to its owners. Thus, the criterion of business as to whether a move is good or bad is basically whether or not the move will contribute to some ultimate profit for the company.

And business, on the other hand, must recognize that the end objective of the universities is to further knowledge—either through greater insight into new theories of behavior, or through spreading present experience among greater numbers of scholars.

Even though the end objectives of business and the universities seem to be miles apart, both are dealing with people in complex real-life situations. And the very fact that their interests are different often brings two quite highly developed sets of resources to bear on a common object of inquiry.

There are several other points. One is that a research project accepted by a university frequently will be done for less cost than it would be by a private organization. This is not always so, but it usually holds true. The reason for this is that graduate students may perform much of the work as a part of their training in actual research. Their motives are to learn rather than to make a living at this work; this results in a lower cost. The research work performed by a university will almost always be of the highest quality because it is performed by persons who are dedicated to professional pursuits and who are unaffected by external considerations.

Our experience at the Edsel Division in the use of academic research organizations has been excellent. We plan to continue these associations, and we recommend this approach to other areas of business or industry, whether large or small.

> WE must not say, Let us begin by inventing principles whereby we may be able to explain everything; rather we must say, Let us make an exact analysis of the matter, and then we shall try to see, with much diffidence, if it fits in with any principle.
>
> —*G. J. M. Pellissier on Voltaire*

Leadership . . . IS EARNED

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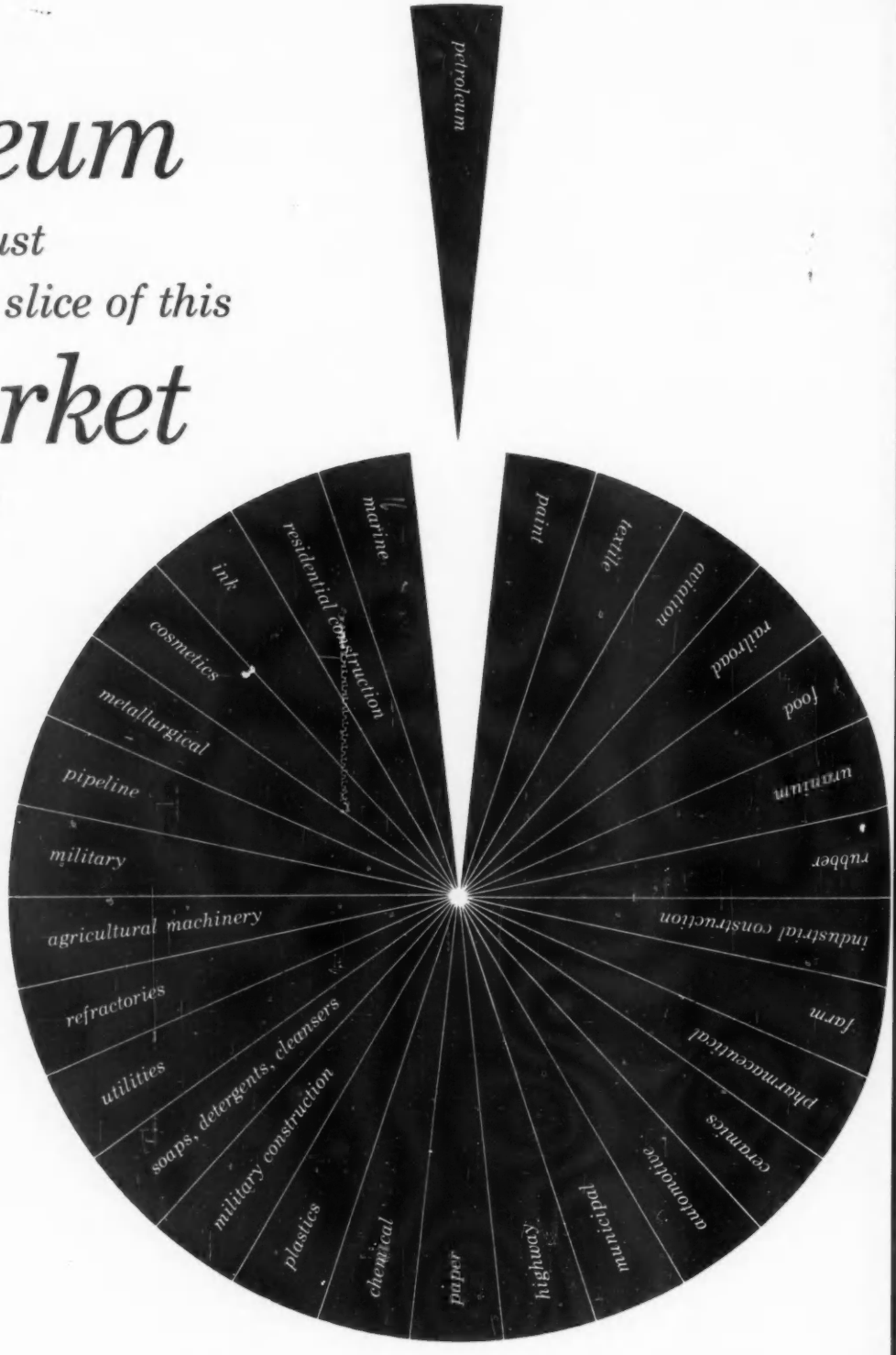

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So many worlds, so much to do,
So little done, such things to be.
(Tennyson)

TECHNOLOGICAL HORIZONS

ENERGY FROM NUCLEAR FUSION

ENERGY, its availability and cost, is one of the prime determinants of the economic potential of an area or nation. The future economic potential of the United States will depend, as much as on any other factor, upon our ability to expand the supply and decrease the cost of energy.

In past decades, our consumption of total work-energy has doubled every 15 years and of electrical energy every 8-10 years. If this rate of growth were to continue for a few more decades, the strain on our conventional energy resources (coal, oil, and natural gas) could become very severe.

The Qualifications On Nuclear Fission

Fortunately, energy from nuclear fission (the splitting of heavy atoms) has arrived on the scene before—but not long before—our supplies of fossil fuels begin to wane. Nuclear energy from fission offers great promise for the future, and it may supply the answer to the problem for decades to come.

But energy from nuclear fission offers problems of its own. One problem is cost. In the United States, electric power from nuclear fission in reactors now under construction will probably be somewhat more costly than power from conventional fuels. Costs in nuclear reactors will no doubt be lowered substantially as we move out of the "horseless carriage" stage of reactor design and construction. But the fact that power from fission employs the heat-motion-electricity sequence, as do conventional plants, puts a lower limit on costs. Best present guesses are

that, in a decade or two, costs from nuclear fission may be cut to around 5 to 6 mills per KWH (50 per cent plant factor), as compared with 6 to 7 mills in a favorably located, modern steam plant using conventional fuels.[1] The cost savings from nuclear fission are therefore not likely to be great except in areas where high transportation costs result in high conventional fuel costs.

Another problem is that of disposal of radioactive wastes. At present, this is a minor problem. But if by 1980 we are producing 225 million kw of power from nuclear fission (roughly twice total U.S. electric power capacity today), as Chairman Strauss of the AEC recently predicted, the quantities of radioactive wastes generated will be enormous. True, this problem is not necessarily incapable of solution. One possibility, though a costly and risky one, is to load the wastes into rockets and shoot them off into space. Another more probable solution is to develop technology for utilizing the radioactivity for a second stage of electric power production—a distinct possibility since, in contrast to fission itself, which emits heavy nuclei, the emissions from wastes are electrons that, when passed through a conductor, constitute electricity.

A third problem, though not an imminent one, is that of fuel resources. Potential supplies of uranium and thorium, though vast in terms of today's requirements, are apparently located in commercial quantities in a relatively few places on the earth's surface, some of the most important of which are vulnerable to military or political action.

[1] Further gains in efficiency of steam plants using conventional fuels will probably be made, but they will be increasingly difficult and in all probability will be largely or entirely offset by higher fuel costs.

Greater Hope for Nuclear Fusion

Covetous eyes, therefore, are being directed toward another form of nuclear energy: fusion, the merging of light atoms. If commercial production of electric power could be achieved, it might solve the energy problem for "all time." It would largely solve the problem of radioactive wastes. The quantities of such wastes created from fusion, in proportion to the amounts of energy generated, are relatively small. It would solve the problem of fuel resources: There is enough hydrogen in the air, or deuterium ("heavy water," the more likely fusion fuel) in the sea to meet all conceivable needs for millions of years. And it might solve the problem of costs, not because fusion plants would be less expensive—they would probably be much more expensive—but because, from a given weight of fuel, the amount of energy released in fusion is several times greater than that released in fission.[2] More importantly, it seems likely that it will be possible to draw off the energy released from fusion directly as electrical energy, without using the boilers and turbines required in the conventional heat and motion process.

When?

The timing of commercial production of electric power from nuclear fusion is the sheerest kind of speculation. According to our informed sources, the development of basic techniques for utilizing fusion is still a decade, more or less, short of the comparable state of development regarding fission when the Manhattan Project was launched in 1942. And, although some of our most brilliant scientific minds are now working on fusion, their numbers are relatively small in comparison with the crash program on the A-bomb in 1942-45. Furthermore, a host of technical problems clutter the scene, not the least of which is developing materials which will withstand the extremely high temperatures involved and condensers capable of storing the huge electrical charges required.

Nevertheless, there are reasonable grounds for optimism. Present knowledge regarding fission does provide a running start in learning about fusion, and further research in fission may often yield information which is useful in fusion. British scientists are reported recently to have achieved a hydrogen fusion reaction in a "magnetic bottle." The reaction lasted for only a small fraction of a second, it is true, and the energy released was far less than that required to trigger the reaction. But the experiment did demonstrate the fact that fusion can be achieved on a small and therefore useful scale and—more important—that the magnetic bottle or some similar device may provide the solution to the problem of heat-resistant containers.

Russian scientists have also been experimenting in this field, and their cryptic reports suggest considerable progress. After their performance with the earth satellites, one would be foolish

[2] The amount of power released from fusion is not "a thousand" times greater than that released by an equal weight of fuel in fission, as frequently reported in popular magazines. The H-bomb (fusion) is "a thousand" times more powerful than the A-bomb (fission), but this is because it is feasible to utilize a much greater weight of fuel in fusion than in fission and hence achieve a greater explosive effect.

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indeed to look upon these reports as idle boasts.

When electric power from fusion will come is anybody's guess. The scientists who have had the most intimate experience with both fission and fusion say that 25 or 30 years would be a "normal" developmental period, and it could take 50 years or longer. On the other hand, they recognize that a few breakthroughs like the magnetic bottle could shorten this to a decade or so.

The Cost

Guesses as to production costs are even more speculative. One thing seems certain: fuel costs will be almost negligible. Labor costs are also likely to be very small. Capital costs will be almost the only costs. (Note: We are referring to production, not distribution, costs.) Whether capital costs will be large or small hinges largely on whether or not a technique is developed for bypassing the heat and motion stage and converting nuclear energy directly into electrical energy. In the absence of such a technique, costs may be prohibitively high. With such a technique, electric power may become, as one eminent scientist expressed it, "as free as the unmetered air we breathe." Or a more apt analogy might be "as free as water," where virtually the only costs are capital and distribution costs.

Whatever the answer, the fact of fission and the prospect of fusion are of great significance to business managers. They mean that forward planning can safely be based on the assumption of virtually unlimited supplies of energy, and can probably be based on the assumption of declining or at least constant real costs for energy. They almost guarantee that, over a decade or two at least, it will be good business to proceed with machinery and equipment changes which substitute mechanical energy for human energy. Abundant supplies of low-cost energy mean that real incomes of American families can, and with reasonably intelligent business and political statesmanship should, continue their vigorous long-run climb, and that business capital planning may be scheduled accordingly. —*Robert C. Turner*

NEWEST DEVELOPMENTS IN THE COMPUTER FIELD

IBM and Automatic Control

RECENT personnel changes within IBM indicate that IBM is preparing to emphasize the area of automatic recording of information and automatic control of machines and processes in the near future. T. V. Learson, one of its top men of action,[1] has recently been placed in charge of IBM's time-equipment and military products divisions. Although historically the time-recording equipment was the line that paid for the development of punched-card equipment, in recent years this division has been relatively small and weak compared to the data-processing and electric typewriter divisions.

Recently, however, IBM has developed a "building block" production-recording system, a time clock that punches cards, and it has the production contract for the SAGE Air Defense System Computers. All of these developments are steps in the direction of automatic data-recording and automatic control. And the time-equipment division is the logical place for the function of linking computers with machines.

A further example of the growing emphasis on this area is the fact that the new 610 Autopoint computer (see below) has been given to the time-equipment division to market, rather than to the data-processing division, which markets and sells all the other IBM computers. This is likely to provide a strong impetus to upgrading the time-equipment sales force.

It may be months or even a few years before the results are apparent, but it is a safe bet that IBM anticipates significant developments and startling growth in this area. It is preparing for the day when computers will be used to control the operation of chemical plants and oil refineries, as well as for the day when the entire paperwork processing for an organization will be integrated in a single mechanized system into which the raw data will be entered as near the source and as automatically as possible.

Computers and Education

On the subject of future applications of computers, the equipment manufacturers are in practically unanimous agreement that the machines in production today already have capabilities that greatly exceed our ability to use them. In other words, the bottleneck is no longer the machines, but is now a lack of knowledge about the machines and about the problems of data-processing.

Several of the equipment manufacturers have given considerable thought to this problem and have arrived at the conclusion

[1] See W. B. Harris, "The Astonishing Computers," *Fortune*, LV (June, 1957), p. 136, for a discussion of Learson's recent role in IBM's astounding comeback in computer sales.

REACH YOUR MARKET*

*America's decision-makers are reading Business Horizons

that one way to alleviate this shortage of basic knowledge is to elicit the cooperation of the universities. These manufacturers have made their machines available to universities as gifts or at drastically reduced rates for academic research and for training purposes. These programs have been enthusiastically received by around 40 institutions and have greatly contributed to general research programs in the physical and social sciences as well as to the establishment of courses and research in areas related to data-processing and computing.

New Machines

Three important new electronic computers have been announced recently, illustrating the fact that significant developments in computers are still occurring with bewildering frequency.

IBM 610. The IBM 610 Autopoint computer is designed so that it can be operated much like a hand calculator to program a problem automatically while the operator is solving it the first time. Each operation that the operator performs in this process is punched into paper tape which the machine can read in order to repeat the steps automatically for succeeding cases. Thus the machine is extremely accessible and should open to mechanization a large class of problems that, individually, do not have enough volume to warrant programming for a stored-program machine.

About the size of a kitchen stove, the 610 includes paper-tape and keyboard input, and paper-tape and typewriter output, as well as a plug-board for subroutines and branching. It can average around 180 computations per minute with 15-digit numbers, automatically keep track of the decimal point, has an automatic square root operation, has a memory capacity of eighty 31-digit numbers, and rents for $1,150 per month.

Datatron 220. The Datatron 220, recently announced by the Electrodata Division of Burroughs Corporation, is designed to fill the large gap in the present line-up of electronic data-processing machines between the magnetic-drum calculators and the large-scale systems such as the Univac I and the IBM 700 series. Although there have been attempts to fill this gap by adding magnetic tape to the magnetic-drum computers, this has not been a particularly satisfactory solution in most cases, mainly because the speed of the drum machines is not sufficient to justify the use of magnetic tape in most applications.

According to preliminary information the Datatron 220 system combines magnetic-core memory and fairly high-speed magnetic tapes with a rental in the range between about $8,000 and $20,000 per month. The Datatron 220 appears to be from two to ten times as powerful as the best of the present so-called intermediate machines at a 150 to 200 per cent increase in cost. On the other hand, this machine enables one to approach the capabilities of the present large-scale machines without getting into the $30,000-per-month price range.

As the Univac II and the 705 replaced the Univac I and 702 as first-line machines, their users gained a substantial reduction in cost-per-unit computation but at the expense of a total rise in machine rental. It is gratifying to see in the Datatron 220 the development of an efficient machine in the intermediate cost range.

705 Model III. The IBM 705 Model III has (at the present stage) essentially the same internal logic as the original 705, but with markedly improved speed. Perhaps the most impressive feature of the Model III is its magnetic tape facilities, which have a new buffering system, a read-write speed of 60,000 characters per second (a four-to-one improvement over the previous model), and a reading head that checks each tape as it is written to make sure that the written information is readable. The internal computing speed has been essentially doubled, and the amount of magnetic core memory available has been increased to 80,000 positions. Thus the effectiveness of the 705 has—for most applications—been more than doubled at an increase of about 30 per cent in machine rental.

General Accounting

At Appliance Park near Louisville, the General Electric Company has developed an interesting approach to general accounting using the Univac. It has devised a procedure involving some of the techniques of automatic programming by which accountants can control the content and format of the reports produced without having any knowledge of the Univac itself. In this way it has achieved outstanding flexibility and speed without bogging down the computer programming staff with constant changes. Since most of the data for general accounting are available as a by-product of other such applications as sales, accounting, payroll and labor accounting, accounts payable, and budgeting, little preliminary

(Continued on page 120)

book notes and reviews

BOOK NOTES

Prefatory Remarks: The Time Has Come

NORMAN COUSINS coined a now-classic phrase immediately after Hiroshima when he stated flatly that "modern man is obsolete." His thesis was, of course, that our present civilization is bankrupt of resources to cope with the social and moral implications of nuclear fission. This Cassandra-cry has not gone unheeded: A constant battle has been waged in the postwar outpouring of educative writing by scientists, philosophers, social scientists, and theologians. Although much of this writing is as new as nuclear fission itself, much appeals to perennial sources of intellectual and spiritual succor—sources which, sadly, modern man in the press of practical affairs has tended to overlook.

Business leaders, because of their involvement in technological advancement, have grown more and more sensitive to the breathtaking rapidity with which technology is outrunning our social adjustment to it; at the same time they are grimly convinced of the necessity of individually keeping pace with it in order to maintain their firms in the industry, their industry in society, and their society in the universe.

To some extent, being threatened with obsolescence is no new experience for the businessman. Marx quite some time ago insisted that the inexorable process of history would soon fossilize him. With the menacing advance of communism, particularly now in the Middle East, business leadership is becoming increasingly conscious that if it is to prove that Marx' reading of history was biased, it

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• WRITING BUSINESS LETTERS

By J. H. MENNING, University of Alabama and C. W. WILKINSON, Michigan State University

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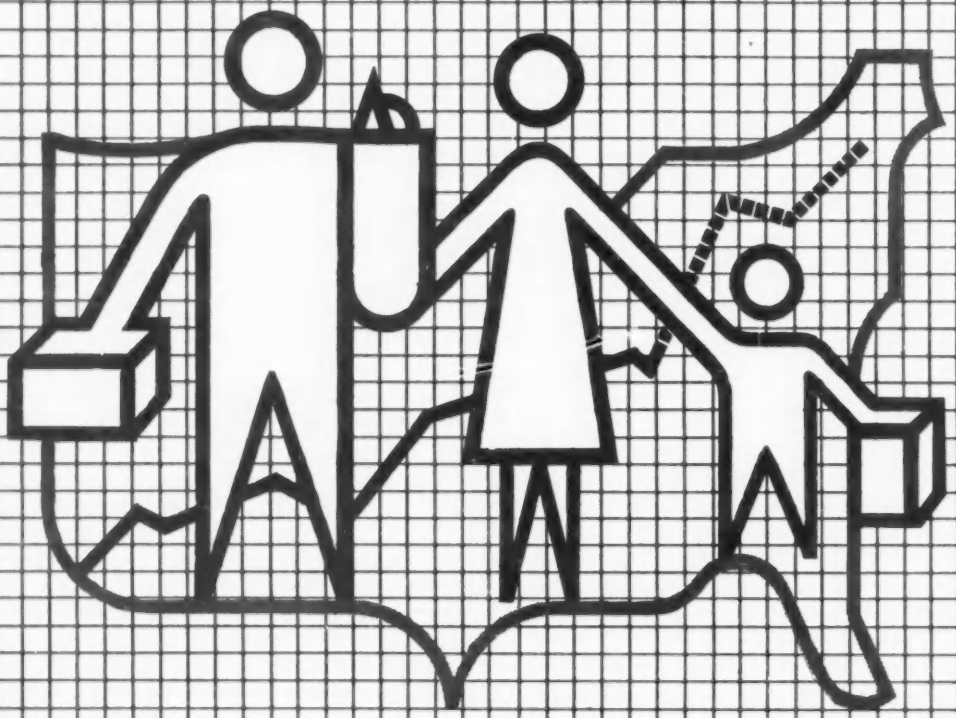

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must learn how to influence events more toward its conception of the social good.

Executives faced with planning decisions for 10 or 20 years in advance must be able to at least sense the perimeters of thought in all the major areas of intellectual activity—the directions of investigation of those who wield great influence on the shape of things to come.

Some executives try to ignore this imperative because the immensity of the task, for the amount of time they have for it, appalls them; some are returning to classrooms for it—as witness the increasing number of executive development programs and conferences such as the one held at Aspen, Colorado, this past summer; some join book clubs or read on the advice of book columns such as this.

No matter what his immediate solution to the problem, the alert executive—whether impelled by an obligation of leadership in society or by a practical need to foster brain power, especially for basic scientific research—realizes that the tremors of another "revolution" in business perhaps equal to the managerial revolution can be distinctly felt.

For some time the business leader has concerned himself with certain peripheral fields. He has long embraced economics and sociology because his entire function in society has been under challenge from socialism and communism. To restate the point a bit, the overwhelming advance of the machine and new forms of energy, together with the tools they provide for looking through space and into the living cell, has for over a decade created a new sensibility to a social ethic and the general problems of science.

Since the 1920's psychology has steadily deepened its impress on the business community, first in the area of personnel relations and most recently in the field of marketing. (More of this in a special section below.)

Some interesting changes, however, are occurring among these invaders of the traditional business areas. Within the peripheral interests of multiplying groups of executives there is a discernible shift from an emphasis on studying the *what* and *how* of our present American society and the place of the business firm in it to one on searching out the *why* not only of the business firm as a social institution but even of our whole Western societal structure.

This switch from a relatively static morphological orientation of outlook to a dynamic developmental approach has drawn into the conference room many names that sound strange in its air of practicality. The historian, the philosopher, the anthropologist, and the theologian are joining the economist, the physicist, and the psychologist. This search for origins because they hold the seeds of future events and foreshadow in a very real way the *Gestalt* or configuration of tomorrow is evident in Mortimer J. Adler's seminar in the Great Books for top West Coast executives and the inclusion of American historical documents on the reading lists of several executive development programs. It is becoming almost necessary to mention religious works as well as the more usual background books on current issues and events in any recommended reading for business leaders.

Some executives have taken to investigating Kant and Stendhal in the belief that, with the advance of technology, men at all levels of labor will have more leisure and should learn to employ it toward great psychic satisfaction and for beneficial contribution to their society.

This impulse led Adler to remark recently that "There is more liberal training going on in industry today than in our colleges" (*Newsweek*, October 14, 1957). This, he asserts, could not have happened 25 years ago. It is a sense of obligation to educate for the "right uses of leisure." Speaking for this executive, he continues, "We create the opportunity of a good human life for human beings. We have to make them use it in the right way—or we'll ruin our society far worse than any atom bomb could."

Other business leaders, however, appear impelled by a more immediate concern that reminds us of an old *Life* editorial (May 2, 1955) "Can We Produce an Einstein?" that concluded with this comment:

> "What is required of our young scientists is a sacred curiosity about nature's great unanswered riddles—not to conquer and exploit, but simply to understand. What is required of the rest of us is a similar respect for the power and beauty, not just the utility, of unrestricted human thought."

This was the starting point of a later article ("Can We Grow Geniuses in Science?") in *Harper's Magazine* by Lancelot Law Whyte, the famous British philosopher of science. He raised this challenge:

> "That is what is required. But the practical question is: What can be done? In an age of teams, technology, and administration, which—with frightening irony—can make a nuclear bomb without real theoretical understanding of the nucleus, how to encourage respect for theory and love of ideas? . . .
>
> "The art of science, the role of intuition in the scientist, has increasingly been recognized. Yet it

still needs to be emphasized that this intuition is not wayward, but always seeks order. All science springs from a latent conviction of unity, which is not itself in the strict sense rational or scientific, but pre-rational, the rational justification only coming later. The philosophical anthropologist concerned with the growth of human culture might say that all the creative drives—religious, aesthetic, intellectual, and scientific—spring from one common source, a biological *elan* in the human brain-mind to establish order in experience. . . .

"We talk of the integration of knowledge and the tyranny of specialisms. But re-integration is a task for the synthetic imagination and its unifying vistas, and we have not yet troubled to call the attention of the oncoming generation to what should be possible and must be achieved if the progressive disintegration is to be overcome. The situation is new—no civilization has previously had to face the challenge of scientific specialization—and the response must be new."[1]

This indeed is the kind of integration prerequisite to answering some fairly impressive *whys*—a process that Whyte feels is basic to "basic research." And this second group of business leaders is deeply concerned about the current state of basic research in the United States.

These are a few of the reasons for the serious interest of many major business executives in what is sometimes called "liberal learning." These reasons in part explain the growing tendency among these executives to gather with their fellows around a conference table to discuss Montesquieu's *Spirit of the Laws* or to place on their night tables Jung's *Modern Man in Search of a Soul.*

The post-World War II "educative writing" mentioned at the beginning of these prefatory remarks has certainly not abated. The new stream of writing for the intelligent layman on esoteric subjects is expanding, and the high quality of the early few is extending to more and more of the later ones.

The early fall publishing season brought out C. F. von Weizsäcker and J. Juilfs' *The Rise of Modern Physics,* a clearly written integration of the origins, problems, and future of modern physics, and Karl Pearson's *The Grammar of Science* (in Meridian Books). In the late fall came the former European best-seller, Rudolf Thiel's *And There Was Light,* a somewhat more superficial world history of astronomy and cosmic speculation; and Philip P. Wiener and Aaron Noland's finely edited overview of scientific thought from the Golden Age of Greece to contemporary cosmology, *Roots of Scientific Thought.*

In this general area of science three more titles should be noted: Donald J. Hughes' well-written *On Nuclear Energy: Its Potential for Peacetime Uses;* Margaret Barron Luszki's *Interdisciplinary Team Research: Methods and Problems;* and Wiley Technological Press' timely publication by Alexander G. Koral, *Soviet Education for Science and Technology.*

A winter title to watch for is Charles H. Hapgood's collaboration with James H. Campbell (foreword by Albert Einstein), *Earth's Shifting Crust: A New Theory Concerning the Earth's Surface.*

Before going on to the books in the general areas of social science and philosophy, we should mention a work by the renowned biologist, Peter B. Medawar, *The Uniqueness of the Individual.* A lucid presentation of the handicaps and advantages of human individuality, it should make interesting companion reading to *The Organization Man.*

SOCIAL SCIENCE, PHILOSOPHY, AND RELIGION

Early fall:

M. F. Ashley Montagu, *Anthropology and Human Nature*

Paul Tillich, *The Protestant Era*
(A Phoenix edition)

Late fall:

Pitirim Sorokin, *Social and Cultural Dynamics*
(A one-volume abridgment of the original four volumes)

Brock Chisholm, *Prescription for Survival*
(Columbia University's Bampton Lectures)

Willis H. Kinnear, ed., *The Creative Power of Mind*
(Contributions from 50 men of science)

A Handbook of Christian Theology
(Essays by such outstanding theologians as Paul Tillich, now at Harvard, and Reinhold Niebuhr)

Raymond Aron, *The Opium of the Intellectuals*
(A French journalist analyzes the myths exploited by the Communists)

Jose Ferrater Mora, *Man At the Crossroads*

Karl R. Popper, *The Poverty of Historicism*

Jacques Maritain, *On the Philosophy of History*

Arnold Toynbee, *Christianity Among the Religions of the World*

Judith N. Shklar, *After*

[1] *Harper's Magazine,* CCXIV (June, 1957), pp. 48-49.

Utopia: The Decline of Political Faith

Sir John Slessor, *The Great Deterrent*

(The lectures, articles, and broadcasts of the Marshal of the R.A.F. and Chief of the Air Staff)

Walter H. C. Laves and Charles A. Thomson, *UNESCO: Purpose, Progress, Prospects.*

In this same area a new one-volume edition of Sir James Frazer's classic *Golden Bough* is due soon. The editor, Theodor H. Gaster, has updated the work. Two new atlases of especial value for those who like to have these matters visually at hand are: Andrew Boyd's *An Atlas of World Affairs*, 72 maps with commentaries on the most important areas of territorial disputes, alliances, and political and economic focus; and the *Rand McNally Atlas of World History*, edited by Robert R. Palmer and six other eminent historians.

EMPHASIS ON AMERICA

One of the most important volumes on the publishers' fall lists is Max Lerner's *America as a Civilization*. This is Lerner's magnum opus that has been twelve years in the making. The tenth volume of the Mainstream of America series is Stewart H. Holbrook's *Dreamers of the American Dream*. Also, the final volume of the late Douglas Southall Freeman's seven-volume *George Washington* is ready. This last volume was prepared by his two researchers, Mary Wells Ashworth and J. A. Carroll. A fourth revised edition of Edward S. Corwin's *The President: Office and Powers* is now available, as is *The American Way* by Dexter Perkins, Cornell's John L. Senior Professor in American Civilization. Norman Cousins has compiled the beliefs of Washington, Jefferson, Madison, Monroe, Adams, Franklin, and Paine in an instructive volume entitled *Religion and the Founding Fathers*, which is not due off the press, however, until mid-winter.

In the paperback Docket Classics a three-volume work under the title of *Tradition of Freedom* is being published as part of a background study for an examination of freedom and justice in modern America. It reproduces excerpts from the major philosophical architects of democratic thought. The work is edited by Milton Mayer for the Fund for the Republic. Volume 1 will cover Milton and Montesquieu; Volume 2, Locke, Adam Smith, and "The Federalist"; and Volume 3, John Stuart Mill, "Great Ideas Syntopicon," and pertinent Supreme Court decisions.

PEOPLE WILL BE TALKING ABOUT

Out:

Rebecca West, *The Court and the Castle*

Gilbert Highet, *Talents and Geniuses*

Frank Lloyd Wright, *A Testament*

Colin Wilson, *Religion and the Rebel*

(By the author of *The Outsider*)

Ben Shahn, *The Shape of Content*

John Munro, ed., *The London Shakespeare*

(A deluxe six volumes)

Floyd Clymer, *Treasury of Foreign Cars, Old and New*

Due by spring:

John Gunther, *Inside Russia Today*

G. Bromley Oxnam, *The Protestant in the Modern World*

Mortimer J. Adler and Louis Kelso, *The Capitalist Manifesto*

Clyde Kluckhohn, *Mirror for Man*

(Premier book)

H. R. Hays, *From Ape to Angel*

J. Bronowski, *Science and Human Values*

Editors of *Kiplinger Magazine*, *Coming: Boom and Inflation*

Background on the Middle East

AMONG the better books on the troubled Middle East scene are these:

Out:

Eric Schroeder, *Muhammed's People*

(An anthology of Muslim civilization)

James Morris, *Islam Inflamed: A Middle East Picture*

D. van der Meulen, *The Wells of Ibn Saud*

(By the former Netherlands Minister to Arabia and close friend of Ibn Saud)

William F. Longgood, *Suez Story – Key to the Middle East*

William R. Polk, David Stamler, and Edmund Asfour, *Backdrop to Tragedy: The Struggle for Palestine*

Wilfred Cantwell Smith, *Islam in Modern History*

Newly out or expected:

Lt. General Sir John Bagot Glubb, *A Soldier With the Arabs*

(By the former Commander of Jordan's famous Arab Legion)

Harry B. Ellis, *Israel and the Middle East*

Freda Utley, *Will the Middle East Go West?*

Cyrus H. Gordon, *Adventures in the Nearest East*
Denis Baly, *The Multitudes in the Valley*

Oxford University will soon issue a valuable atlas of this area called the *Oxford Regional Economic Atlas: The Middle East and North Africa.*

Business and the Popular Press (Nonfiction)

In glancing over the fall lists we are struck by the avalanche of books on the new hero-villain of business – the advertising man. "Madison Avenue" is taking on the sensational and somewhat shady connotations once gathered around "Wall Street." (As an aside, it is reassuring to note that one pejorative term, "robber baron," has given way to "mogul" in the Mainstream of America series' first title, "Age of the Moguls.")

Harper's Magazine was in the vanguard of popular examinations of the advertising field with several articles during the past year. Already off the presses are the *Fortune* compendium of articles for the uninitiated and Vance Packard's *The Hidden Persuaders,* at the top now on the best-seller lists.

Recently issued was *How to Predict What People Will Buy,* a series of magazine articles by Louis Cheskin, a famous name in the field of motivational research. And *Time's* director of promotion sketches outlines some of his techniques in *Persuasion for Profit* (Nicholas Samstag).

Three other popular titles appear on the lists: William N. Freeman's *The Big Name, The Articulates* edited by John M. Henry, and Walter Goodman's *The Clowns of Commerce.* Due by spring is Martin Mayer's *Madison Avenue* and Shepherd Mead's *The Admen.*

Of more interest, of course, to the serious business reader are the following books in the areas of motivational research and public relations:

Early Fall:

Charles Berg, *Deep Analysis*
(Seagull edition)
Charles E. Osgood, George J. Suci, and Percy H. Tannenbaum, *The Measurement of Meaning*
(Stresses the "semantic differential")
Jerome Rothstein, *Communication, Organization, and Science*
Clara Thompson, *Psychoanalysis—Evolution and Development*
Fred T. Schreier, *Human Motivation: Probability and Meaning*
Richard Haggart, *The Uses of Literacy: Changing Patterns in English Mass Culture*

Late Fall:

Ralph Straetz, *PR in Cincinnati*
Dorothy Stock and Herbert A. Thelen, *Emotional Dynamics and Group Culture*
Richard E. Chapin, *Mass Communications: A Statistical Analysis*
Jerome S. Bruner and others, *Contemporary Approaches to Cognition: A Symposium Held at the University of Colorado*
Peter McKellar, *Imagination and Thinking*
Rex F. Harlow, *Social Science in Public Relations*
Wilbur Schramm, *Social Responsibility in Mass Communication*
Patrick Mullahy, ed., *A Study of Interpersonal Relations*
(Sixteen contributors including Harry Stack Sullivan and Ruth Benedict)
Eleanor Bertine, *Problems of Human Relationship*

Due in spring:

Ira Progoff, *Depth Psychology and Modern Man*

Specifically for the Business Executive

Early fall:

Norman Cousins, ed., Thomas J. Watson, intro., *The Will to Think*
(Best from IBM's *Think*)
Auren Uris, *The Efficient Executive*

Late fall:

Thomas C. Cochran, *The American Business System: An Historical Perspective*
Jacob Viner, *The Long View and the Short: Studies in Economic Theory and Policy*
Paul F. Lazarsfeld and Wagner Thielens, with a contribution by David Riesman, *The Professorial Mind: Social Scientists in a Time of Crisis*
John F. Due, *Sales Taxation*
Robert Engler, *The Politics of Oil: A Study of Private Power and Democratic Directions*
Donald T. Clark and Bert A. Gottfried, *Dictionary of Business and Finance*
Donald A. Laird and Eleanor C. Laird, *The Techniques of Delegating: How to Get Things Done Through Others*
Charles R. Walker, *Toward the Automatic Factory*
(Referred to as "a pioneer work")
Ludwig von Mises, *Theory and History*

(Famous economist summarizes his views on what man can know in a social science like economics and how his knowledge can be used in shaping both ends and means in the Western world)

Winter:

S. Morris Livingston and Richard B. Heflebower, *Competition in the Petroleum Industry*

(Three volumes)

Knut Wicksell, *Selected Papers in Economic Theory*

N. Irving Sax, *Dangerous Properties of Industrial Materials*

(By the Consultant on Industrial Safety, Nuclear Development Corporation of America)

—*Lois S. Headings*

REVIEWS

LOCATION AND SPACE-ECONOMY. By Walter Isard *(New York: The Technology Press of Massachusetts Institute of Technology and John Wiley & Sons, Inc., 1957, pp. xix, 350. $8.75.)*

WITH *Location and Space-Economy*, Walter Isard, Professor of Economics at the University of Pennsylvania, has made a major contribution to economic literature. He has written a book primarily for economists in which he presents a general equilibrium theory of location and space. In the words of Professor Isard, the objective of this volume is "to improve the spacial and regional frameworks of the social science disciplines, particularly of economics, through the development of a more adequate general theory of location and space-economy" (page viii).

In developing his synthesis of the economics of location and space, Professor Isard engages in model-building. He recognizes the inherent limitation of abstract economic models—the lack of any practical, immediate application of these models to the solution of specific problems. However, this limitation does not detract from the usefulness of his work in providing a fundamental theoretical framework for location and space decisions.

This book fills an obvious need in Anglo-Saxon economic literature. For the most part, typical pricing and trade models have employed assumptions that excluded consideration of problems of distance and space. Since the traditional economics of the English school has passed over location and space theory, the author depends mostly on economists of the German school in developing his general equilibrium model of space and location theory. For the basic elements in his theory, Professor Isard draws most heavily from the works of German economists Weber, Thünen, and Lösch. His book is largely a synthesis of the works of these three men, and his primary contribution lies in his critical evaluation and synthesis of their writings into a general equilibrium location theory.

The problems of location and space-economics are outlined in Chapter 1, which provides the basis for the remainder of the book and for the proposed second volume. Isard's thesis is that "location and trade are as the two sides of the same coin" (page 6). He describes the evolutionary development of a hypothetical area as settlement takes place; his objective is to show the influence of space and transport problems on economic development. With this background the author poses questions that illustrate the need for a theoretical framework in which to consider these problems. Chapter 1 has further general interest since questions of urban, metropolitan, and industrial development are raised. However, it should be kept in mind that there are no solutions in this volume—it treats only the theoretical framework of location and space-economics.

Professor Isard maintains that location theory is equal in importance to trade theory. He contends that these two phases of economic life are interrelated and inseparable, and that to understand and analyze trade requires an appreciation of such location factors as resources, topography, and other environmental influences. Few would disagree with this view. He states further: "a broadly defined general theory of monopolistic competition can be conceived as identical with the general theory of location and space-economy" (page 54). By "broadly defined general theory," Isard means a theory that would include some consideration of the immobility of factors of production and goods. He would also include as a part of a general location theory, trade theory models of interregional and international trade such as that of Ohlins. Hicksian and Chamberlinian general equilibrium models become special cases of the Isard general equilibrium spacial theory model.

In this book, Isard uses the term "transport inputs" instead of the term "distance inputs," used in his earlier writings. He defines a "transport input" as, "the movement of a unit of weight over a unit of distance," so, "In an indirect sense, transport inputs correspond to the exertions of effort and other factor services required to overcome

resistance encountered in movement through space where friction is present" (page 79). Isard classifies a transport input along with labor, capital, land, and management as vital to the economic process. He maintains that it is not necessary to think of the transport input as another factor of production, but that it is important to recognize the role that the transport input plays in the production and consumption processes.

In Chapters 5 through 9, Isard applies the concept of transport inputs to the generally accepted body of existing economic theory. These chapters comprise the heart of his book and contain his contribution to location economics. In each of these chapters Isard relaxes selected *ceteris paribus* location and space assumptions of traditional economic models by incorporating into these models the concept of transport inputs. In Chapter 10 he develops a mathematical treatment of location theory, and in Chapter 11 he presents a graphic synthesis and summary of location theory. The book concludes with a basic location principle that draws together the theories of Weber, Fetter-Launhardt, Lösch, and Thünen.

Professor Isard is working on a second book to accompany this volume. In this second volume, he plans to develop the principles of a general regional theory. Practitioners of regional and city planning, and business executives responsible for location decisions should find the planned second volume of more immediate interest than this book.

Fred W. Kniffin
Assistant Professor of Marketing
Indiana University

Studies serve for delight, for ornament, and for ability. Their chief use for delight is in privateness and retiring; for ornament, is in discourse; and for ability, is in the judgement and disposition of business. For expert men can execute, and perhaps judge of particulars, one by one; but the general counsels, and the plots and marshalling of affairs, come best from those that are learned.

—FRANCIS BACON

PROXY CONTESTS FOR CORPORATE CONTROL. By Edward Ross Aranow and Herbert A. Einhorn *(New York: Columbia University Press, 1957, pp. xxii, 577. $15.00.)*

PROXY contests for the control of large corporations have become increasingly numerous in recent years. The basic reason for this is the widespread distribution of stock ownership. Because of this distribution, many corporations are controlled by managements that have only a minority ownership interest in the corporation. By acquiring a sizable portion of the outstanding stock of a corporation (from 10 to 25 per cent of the issued shares), outside interests are in a position to challenge the existing management of a corporation. The occasions for such challenges vary. Charges that the existing management is inefficient, wasteful, lethargic, and unprogressive may be levied. Or, it may be charged that the existing management is looking after its own financial interests at the expense of the stockholders. Sometimes it is claimed that the management is corrupt and is looting the corporation of its properties.

The group in control may claim that the outside interest desires to gain control of the corporation in order to engage in questionable practices, or to acquire prominent positions and the emoluments that go with control. In some recent contests for corporate control, the challenging group was charged with being interested only in its own financial gain—they were said to be "financial buccaneers" seeking to use the corporation for their own personal gain.

The authors of this volume, practicing attorneys who have specialized in representing various parties in proxy contests, have provided a detailed handbook and compendium to guide managements and insurgents involved in corporate control contests. The authors say that "early in our experience, we found that there was no authoritative material which could furnish a guide to the practicing attorney, house counsel, corporate executive, and others directly involved in such contests." Consequently, they wrote the present book to provide such a guide.

The book is divided into five parts. In Part I the matters preliminary to a contest and stockholders meeting are discussed. The legal and practical problems of waging a proxy contest are presented in detail. The waging of a proxy contest is no simple undertaking. Expert help is required, and contestants must be prepared to engage in legal battles and maneuvers. Each group —management and insurgent— must convince the stockholders on the side lines that their best interests will be served by giving their votes to the one or to the other group. Above all, the outline in this part of the book creates an awareness that proxy battles will be expensive—in major battles, costs may run into the hundreds of thousands of dollars.

Part II discusses the problem of proxy solicitation, and includes the very important regulations of the Securities and Exchange Commission. Part III is devoted to the conduct of meetings and the election of directors. The matters of cumulative voting and classification of

directors—which can be very important in some instances—are discussed fully in this section. Part IV discusses judicial remedies and procedures. In this section some of the legal technicalities and procedures are described in detail. Inasmuch as most proxy contests involve legal disputes, the types of legal problems that arise and the probable remedies by the courts are important.

Finally, Part V deals with the expenses of proxy contests. The cost of a proxy contest runs high—an expense especially burdensome to the insurgent group because it has to bear the cost, whereas management usually has the use of the corporate funds. "The fees of lawyers, accountants, security analysts, public relations experts, and professional proxy solicitors, together with the expenses of printing, mailing, telephones, telegraph, travel, and administrative personnel run into many thousands of dollars."

As stated earlier, this book is written primarily for those concerned with proxy contests; for them, the volume is invaluable. However, it contributes little to the understanding of the corporate problem resulting from the separation of ownership and control. It does not explain the institutional factors that make it possible for a group with relatively small stockholdings to gain control of a large corporation and to remain in control until challenged by an insurgent group also holding a relatively small amount of the outstanding stock of the corporation. This important aspect of the subject remains to be explored by others.

Nathan L. Silverstein
Professor of Finance
Indiana University

Technological Horizons

(Continued from page 110)

work is needed before the machine processing can be started.

New Book

Perhaps the best of the recent crop of books designed to explain electronic computers to management is *A Management Guide to Electronic Computers*[2] by William D. Bell. In addition to presenting an extremely lucid discussion of the computers, their workings, and their abilities and limitations, Mr. Bell realistically discusses many of the important management considerations involved in the use of computers.

He outlines a rather detailed program to guide an organization through the process of deciding whether or not to acquire a computer system. Perhaps the most interesting feature of this book is the inclusion of 21 case histories representing a variety of situations in which computers are actually being used. Most of these cases are well known to people who are already well informed about computers, but they form an extremely convenient and interesting package for the nonexpert. Needless to say, short write-ups of complex situations are often distinguished by the information that is omitted rather than by what is included, but Bell has done a very creditable job in this respect. The strongest advantage of the book is its extremely realistic over-all attitude concerning an area that has been overglamorized. In summary, this is not a book for experts, but it does an excellent job of presenting the basic information that *management* needs to know about electronic computers.

—*E. W. Martin, Jr.*

[2] New York: McGraw-Hill Book Co., 1957.

BACKGROUND TITLES ON SATELLITES AND ROCKETS

IMMEDIATELY after the news release on "Sputnik," the bookshop of the Hayden Planetarium of the American Museum of Natural History in New York City suggested the following books about space travel:

Rockets, Missiles and Space Travel by Willy Ley, one of the foremost popular interpreters in the field of rockets and the exploration of space
The Viking Rocket Story by Milton W. Rosen
Rockets, Missiles and Moons by Charles Coombs
The Making of a Moon by Arthur C. Clarke
Vanguard: The Story of the First Man-made Satellite (an unfortunate title) by Martin Caidin
Frontier to Space (slightly more advanced) by Eric Burgess
Space Satellite by Beeland and Wells
Exploring Earth and Space: The Story of the IGY by Margaret O. Hyde

TITLES released since these recommendations include:

Realities of Space Travel (a British import) edited by L. J. Carter
The Space Encyclopaedia: A Guide to Astronomy and Space Research (prepared in England before "Sputnik")
Man-Made Moons by Irving Adler
Satellite (a reprint) by Erik Bergaust and William Beller
Earth Satellites and the Race for Space Superiority by G. Harry Stine

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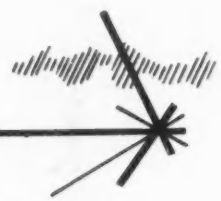

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